1   **BAR CODED BILL PAYMENT SYSTEM AND METHOD**

2   This application is a continuation-in-part application under 37 C.F.R § 1.53(b) of

3   application Serial No. 09/737,011, filed December 14, 2000.

4   **BACKGROUND OF THE INVENTION**

5   The present invention relates to a system and method for performing financial

6   transactions, and more particularly, to a payment system and method using bar code

7   identification.

8   <u>Traditional Bill Payment Paradigm</u>

9   The current paradigm of the bill payment cycle for goods and services rendered

10   has improved only in incremental steps since the beginning of time. In ancient times,

11   most goods and services were exchanged between individuals, using the common

12   currency of the realm or by a mutually agreed upon barter arrangement. Extension of

13   credit for goods and services was generally limited to the affluent and wealthy. When

14   payment was due, handwritten invoices were hand delivered. Sometime later, cash

15   payment would be remitted in person. Most trade occurred at the local level between

16   individuals, exchanging cash or barter goods.

17   In the late 1800's and early 1900's in the United States, credit for goods and

18   services rendered remained essentially unchanged at the local level. Society became less

19   stratified and there became an affluent middle class populace between the highest and

20   lowest levels of society. Credit for goods and services became extended to select groups

21   and individuals within this populace as well as the affluent and wealthy. However,

22   invoices were still handwritten tallies of goods and services rendered, which were paid

23   for in cash. The Industrial Revolution precipitated many technology advances in

1   transportation and communication, which affected many facets of daily life. In

2   commerce, the foundation cornerstones of the financial services industry, as it exists

3   today, were developed and shaped. With an infrastructure of a national mail network and

4   a solid central banking system in place, the more affluent and wealthy individuals began

5   to have a larger and more convenient span of financial control with extended remote

6   banking credit services. Merchants could then send their invoices to distant customers

7   through the national mail network and receive payments, some time later, in the form of a

8   bank draft honored by the local bank for cash.

9   In the generations following World War II to the present time, with general

10   society becoming more and more homogenized and, on the whole more affluent, banking

11   services are available and competitive at every level. Bank checking accounts (and

12   therefore a credit mechanism with which to pay remote billers) are available to 60 percent

13   or more of the population. The national mail network is a very cost-effective delivery

14   system for local and remote customers of automated or machine printed monthly invoice

15   statements, which average 15.9 billion annually. Customers write checks, as payment for

16   these invoices, and return them via the mail network. When received at the merchant

17   directed return location (a bill payment-processing center), these mail payments are

18   opened, the checks deposited, and the customer accounts credited with the face amount of

19   these check payments.

20   If everyone were to pay their bills on or before the due date with valid checks, this

21   state of the bill payment industry might be sufficient to satisfy most of today's societal

22   needs. However, this is not the case. Some people never pay their bills on time, for a

23   variety of reasons. Payments made with a check are not always covered with sufficient

1   funds at their bank. The end-result consequence to the biller is a finite cost that is

2   directly attributable to the disruption of the flow of goods and services through his

3   business.

4   To cover the costs incurred by these late payments, billers have only two options

5   available to them. One option is to spread this overhead cost over of all the goods and

6   services that they provide, with the possible consequence of pricing their products or

7   services out of the competitive price range for similar or substitute set of products and

8   services. The second option is to impose payment penalties on those customers who pay

9   late – for whatever reason. This second option is generally more preferable since it

10   targets the problem population segment directly. However, billers are often unable to

11   recover the full cost of late payment consequences from those customers and still stay

12   within the public legal and regulatory mandates.

13   Recently, there have been business attempts to further automate the bill payment

14   process by the electronic delivery of biller invoices and the subsequent electronic

15   remittance of payments. While the electronic presentment of bill payments might address

16   the current 15% or so of the U.S. population with access to the Internet, it does not

17   address the 85% without Internet access. Within the next decade, the Internet wired

18   segment of the population will not grow as fast as the current crop of "dot com"

19   entrepreneurs hope or project in their "new" economy business plans. The latest statistics

20   show that less than 3% of the American public may use on-line remittance services.

21   Federal statistics indicate that fully 30-40% of the U.S. population may be

22   "unbanked". The "unbanked" population operates solely within the cash economy

23   without any formal banking level traceability. There are many reasons that people prefer

1   to operate in this economy, some of which are culturally related. Others prefer

2   anonymity for quite specific reasons, such as illegal aliens avoiding detection and

3   deportation by the INS or others hiding their sources of income from the IRS. Federal

4   statistics also indicate that 30-40% of the adult U.S. population may have a working

5   fourth grade education or less.

6   There may be a correlation between those people opting for the cash economy and

7   the fact that many may not be able to maintain and balance a checkbook. Most people

8   would rather admit to being "unbanked" rather than to being illiterate. The "unbanked"

9   segment of the population has difficulty operating in a check-oriented society and paying

10   their monthly bills to remote billers. At the local level, the proprietor-operated check

11   cashing storefronts may service some of the needs of these individuals. Weekly

12   paychecks are cashed for a transaction charge (mostly based on the face value of the

13   check), and money orders are then bought, to be enclosed with mailed bill payments.

14   When bill payments are long past their due date, these individuals may have to resort to

15   more expensive electronic wire services to avoid service disconnects.

16   For the great majority of printed bill payment invoices that are distributed every

17   month, each biller automates and optimizes its bill collection and remittance process to

18   suit the requirements of its installed paper handling equipment and flavor of customer

19   account numbering assignments and schemes. Bill remittance stub sizes and formats

20   vary from postcards printed with dot matrix printers to full-page 8 ½" by 11" sheets with

21   laser printed invoice information on pre-printed forms. Each has a tear-off bill remittance

22   stub portion that is then mailed back with a check payment. Account numbers on these

23   bill remittance stubs appear in different (and sometime multiple) spatial positions,

1   formats and fonts. While still not universal, most billers have formatted their account

2   numbers (and other customer related information) on bill remittance stubs in Optical

3   Character Recognition (OCR) readable scan lines. Some of this information is printed

4   twice on the bill remittance stub as a contingency that the paper bill remittance stub is

5   shredded or mangled by the automation equipment. Human data entry of this customer

6   account number information is the ultimate fallback mode for processing this payment.

7   <u>Traditional Bill Payment Examples</u>

8   Figure 1 shows an exemplary local gas company remittance stub 100 utilizing this

9   manner of design. The biller in this example has assigned a numeric account number to

10   each of his customers. As shown in Figure 1, the customer account number is printed

11   three times, the human readable one 102 under the "Your Account Number" heading, and

12   the other two 103, 104 printed twice in machine-readable form. Account number check

13   digits 101 are used to validate the account number. Each digit in the account number is

14   multiplied by a mathematical weight, and then all these products are added together.

15   Dividing the total sum by 10 and complementing the remainder yields the check digit that

16   is compared against the indicated digit. If the digits match, then the account number has

17   been detected and read correctly. Check digits are employed to eliminate two types of

18   common errors, physical digit read errors and transposition errors (when the customer

19   account number is processed manually).

20   Figure 2 shows an exemplary remittance stub 200 from a local power company

21   that assigns a combination of letters and digits to its customer base. There are two forms

22   of the customer account number 201 that appear on the bill remittance stub. The first 201

23   is designed to be human readable because it appears within a printed text box labeled

1   "Account Number". The last digit in the Account Number box is the customer account

2   number check digit. The second form of the customer account number 202 appears in

3   machine-readable form and is embedded in the OCR scan line (underlined for

4   illustration). The leading "4" digit is the customer account number check digit and the

5   remainder of the underlined portion of the OCR line are the digits that can be mapped

6   into the human readable "Account Number" form. The format of this machine-readable

7   OCR scan line 202 is probably a confluence of many internal design decisions, based on

8   several factors. From a human ergonomics perspective, a customer service representative

9   of the power company, during a service call, would never ask a customer to recite his

10   account number from a sequence of digits appearing within the machine-readable OCR

11   line and expect a correct answer. The human readable form 201 of the customer account

12   number is easier for a customer to recognize and to dictate over the telephone when

13   requesting service changes to his account.

14   These two examples illustrate the primary uses of duplicate account information

15   printed on a bill remittance stub – one for simplicity when verbally referring to a specific

16   customer account and the second for the case that the automation process fails and

17   customer account number payment information has to be entered manually.

18   Figure 3 shows an exemplary remittance stub 300 from a gas company, in which

19   the biller automates part of the bill payment remittance process by including, on the bill

20   remittance stub, company proprietary bar coded information 301 that does not appear to

21   be related in any way to the printed customer account number. While the format of this

22   bill remittance stub 300 may marginally advance that biller's state-of-the-art bill

23   collection and system processing with the use of newer and improved automation

1   equipment, it does not significantly decrease, in favor of the customer, the overall bill

2   payment cycle. The great majority of the bill payment cycle time consists of non-

3   deterministic time delays in the national mail network during the biller-to-customer and

4   the payment-to-biller delivery paths. These random time delays, combined with very

5   short biller dictated due dates and (possibly intentional) delayed processing times, always

6   work to the detriment of the customer. As a result, some customers are assessed penalty

7   payments, which are sometimes more profitable than the basic goods and services

8   provided.

9   The system of bill payment invoicing, collection and remittance processing

10   remains a fragmented industry because there are no common bill remittance stub format

11   standards, no common customer account number representation standards, no common,

12   expedient data and money delivery mechanisms to the biller, and no large bill remittance

13   stub processing networks, in addition to payment cycle delays that always work to the

14   detriment of the customer to favor the biller (with a correspondingly greater profit

15   margin). By constructing a common set of standards from the current set of available

16   technology components, a universal national bill payment network could be implemented

17   that addresses the above list of industry problems, resulting in a positive economic impact

18   to the business community at large. For such a set of standards to work, the cooperation

19   of several large organizations would be required; however increases in raw profit and

20   new business growth opportunities should induce such cooperation.

21   As shown in Figure 4, a system 400 consistent with the existing bill payment

22   paradigm uses the national mail network and biller payment processing centers to convert

23   physical paper into electronic data and bank credits. The current bill payment network is

1   a paper based network that primarily relies on the central banking system for processing

2   customer remitted bank draft payments and the national mail network for customer

3   invoice delivery and the return of mailed bill payments. In system 400, for all the goods

4   and services rendered to a customer over a given billing period, the biller accounts

5   receivable 401 accumulates a dollar total and generates a detailed machine printed

6   invoice (which may take 4-5 days after account cut-off time to process) that is sent to the

7   customer 403 via U.S. Mail 402. The customer (i.e. payee) 403 typically receives the

8   invoice 2-3 days later (which time is variable, without any direct traceability from the

9   perspective of either the biller or the customer).

10   Once the customer receives the invoice in the mail, the customer makes out a

11   check payment or procures a money order 404 to remit with a mail payment, which

12   occurs sometime later, depending on the availability of cash resources and other

13   circumstances. The customer mails the payment via U.S. Mail 405 to the biller collection

14   and processing center 406, where processing time may be 2-3 business days or more

15   (which time is variable, without any direct traceability from the perspective of either the

16   biller or the customer). At the bill payment processing center 406, the following

17   operations are typically performed: opening all received mail; microfilming and/or

18   otherwise recording all received payments; electronically reading and processing OCR

19   bill remittance stub information; preparing all received check or money order payments

20   for bank submission; and electronically remitting bill payment data, based on check

21   payment verification. Processing time within the processing center 406 may be 2-3 days.

22   It should be noted that there may be sanctioned late payment penalties imposed on

23   credit card payments, wherein a biller might gain an advantage by intentionally delaying

1   an on-time payment by a day or so, thereby causing an otherwise on-time payment to be

2   considered late. For example, for a $200 payment delayed by only one day, a $25 late

3   payment penalty might result in an equivalent Annual Percentage Rate (APR) interest

4   rate of 150%, for little or no marginal cost to the biller. This overcharge, which may be

5   difficult for the customer to trace later, may be compounded by another finance charge

6   for the outstanding unpaid balance amount, made late by that intentional delay.

7   Payment data is next remitted electronically from the processing center 406 to the

8   biller's bank 408, and processing and distribution of electronic payment data is typically

9   done using the Federal Reserve Automated Clearing House (ACH) Network 407, which

10 typically takes 6-9 hours. At the biller's bank 408, the electronic payment data is

11 received from the ACH Network, stripped and reformatted according to biller specified

12 formats, which may take 4-6 hours. Finally, the biller's accounts receivable 401 and/or

13 customer service computer files are updated. Depending on the "legacy factor" of the

14 biller's computer processing systems, this process can range anywhere from 2-3 hours to

15 4-5 days.

16   Assuming zero latency on the part of the customer paying his bill, the cycle time

17 between the customer account cut-off time and the time that the customer payment is

18 applied to his account, using the above time estimates, may range from 13-18 days.

19 Since there is usually some customer delay, the observed bill payment cycle time will be

20 longer.

SUMMARY OF THE INVENTION

Biller-Payor Aspects of the Present Invention

The present invention involves the transmission of payment information via one or more networks (e.g. the Internet and the Federal Reserve ACH Network) to billers of consumer goods and services. This payment information is captured using existing scanners in cash register systems at supermarkets, chain stores, or other retail outlets. Retailers gain access to a valuable affinity draw because everyone has bills to pay regularly. Billers save millions of dollars in collection and processing expenses. Consumers are provided a convenient way to pay any bill quickly and flawlessly for a nominal transaction fee (e.g. $1.00 per bill).

A bill payment system and method consistent with the present invention relies on an additional ISO standard printed bar code on the biller invoice, which is then delivered to the customer via the national mail network. Thereafter, payment information and payment credits are returned to the biller electronically. With the proliferation of the Universal Product Codes (UPC) that are imprinted on every retail product today, an infrastructure for processing bar coded information is already in place. At supermarkets, bar code scanners at all the checkout aisles are used to register the sale of all items for inventory and pricing purposes. Bar coded bill payments would be just another commodity item to be paid for, accepted at retail. Upon receiving a bar coded payment invoice, the customer could go to any supermarket, chain store, post office, or other location which accepts this type of payment, to pay his bill. In return for the nominal transaction fee paid, a customer might receive a printed detailed proof of payment receipt. Billers could be notified immediately and agree to suspend all collection

1 activities, and account posting could take place within 36 hours, all funds remaining

2 within the Federal Reserve Banking system. No state banking licensing would be

3 required, since each biller's approval is secured by means of a biller registration process,

4 which introduces the technical specifications and certification parameters necessary for

5 billers to participate in a system consistent with the present invention.

6 As a participating retail establishment provides bill payment services to the

7 public, it also forms a new portal. A proprietary router/application interface may be non-

8 invasively attached, indirectly, to the retailer's checkout scanner. Through this portal,

9 other services can be offered to consumers. For example, in addition to payments, money

10 transfers (a financial services which may be lucrative to provide) may be provided

11 through a system consistent with the invention. Bank account transactions such as

12 deposits may be made or Internet wallets replenished. Though not required, the U.S.

13 Postal Service (USPS) could be offered a new income stream for simply authorizing this

14 system. The power of an "electronic" postmark may impact the way billers view this

15 system.

16 It is contemplated that the retail industry should provide advertising as they

17 promote the affinity pull they already wish to impart upon the consumer marketspace.

18 The community of consumer billers should provide cooperation because of the potential

19 of this system to reduce what are now very expensive embedded collection costs.

20 Consumers need another way to pay their bills more efficiently than the U.S. Post Office

21 mail can do so today, especially for those without bank accounts or those who desire to

22 use credit for bill payments, and clearly for those who are late. A system consistent with

1   the present invention therefore benefits billers, consumers and retailers who participate,

2   and may be inexpensively and easily established and maintained.

3   Further Payment Aspects of the Present Invention

4   A system and method for payment is further provided, wherein consumers pay

5   their bills at supermarkets, large retail chain, or other stores and receive immediate credit

6   from billers for their payments, which are made using a bar code transmitted

7   electronically to the consumer, e.g., by fax, email, or Internet. The biller receives good

8   payment funds, deposited directly into his bank account, and error-free electronic

9   payment data for consumer bill payments by the very next business day. The biller

10   backdates the received bill payments to the time and date the consumer actually paid,

11   regardless of the time that the payment data takes to post to the biller's accounts

12   receivable system.

13   In another aspect, a method for person-to-person money transfers is provided,

14   wherein a bar coded deposit slip, card, or other printout permits a sender to remit funds

15   directly into a receiver's bank account, and such funds are quickly accessible for

16   withdrawal at a nearby automated teller machine, or for a debit card purchase.

17   In one aspect, a bill payment system consistent with the invention comprises a

18   payee and a scanning apparatus. The payee transmits or transfers to at least one payor a

19   unique bar code comprising data identifying at least the payee and the payor. The

20   scanning apparatus is configured to scan a printed representation of the bar code . The

21   scanning apparatus is capable, based on information stored in the bar code and a payment

22   made by the payor, of transmitting funds or initiating a funds transfer to the payee in a

1   predetermined amount and transmitting data or initiating a data transfer to the payee

2   regarding the payment.

3   In method form, a bill payment method consistent with the invention comprises:

4   transmitting or transferring to at least one payor a unique bar code comprising data

5   identifying at least the payee and the payor; and permitting a third party to scan a printed

6   representation of the bar code and, based on the identifying information of the bar code

7   and a payment made by the payor, to transmit funds or initiate a funds transfer to the

8   payee in a predetermined amount and transmit data or initiate a data transfer to the payee

9   regarding the payment.

10   In another aspect, a method of transferring money consistent with the invention

11   comprises: scanning a printed bar code comprising data identifying at least an account

12   number corresponding to an account to which a deposit can be made and a destination

13   payment network corresponding to the account; and transmitting funds or initiating a

14   funds transfer, based on information stored in the bar code and a payment made by a

15   payor, in a predetermined amount to the account.

16   In a further aspect, a deposit slip consistent with the invention comprises a printed

17   account number and a unique bar code comprising data identifying at least the account

18   number and a destination payment network corresponding to the account number.

19   In still another aspect, a printed bar code consistent with the invention comprises

20   data identifying at least an account number and a destination payment network

21   corresponding to the account number.

22   In yet a further aspect, a method for performing an Internet financial transaction

23   consistent with the invention comprises transmitting or transferring to a payor a unique

1   bar code comprising data identifying at least a payee and a destination payment network

2   corresponding to the payee.

3   In still a further aspect, a method of providing for payment from a payor to a

4   payee comprises: making available to one or more payees a standard format for

5   representing on a printed document data including at least a payee and a destination

6   payment network corresponding to said payee; providing at one or more locations of one

7   or more third parties one or more scanning apparatus adapted to read data in said standard

8   format; receiving by electronic transmission data comprising said destination payment

9   network identification, payee identification and payment amount; and providing

10   information to said destination payment network to effect transmission of funds to an

11   account of said payee in an amount identified by said payment amount and concurrently

12   effecting or initiating transmission of payment information to said payee.

13   **BRIEF DESCRIPTION OF THE DRAWINGS**

14   Figure 1 is an exemplary prior art remittance stub from a utility company;

15   Figure 2 is another exemplary prior art remittance stub from a utility company;

16   Figure 3 is another exemplary prior art remittance stub from a utility company;

17   Figure 4 is a process flow diagram of an exemplary prior art bill payment system;

18   Figure 5 is a process flow diagram of an exemplary bill payment system

19   consistent with the present invention;

20   Figure 6 is an illustration of an exemplary data structure of elements underlying

21   the bar code "signature" in one embodiment of the present invention;

22   Figure 7 is an illustration of another exemplary data structure of elements

23   underlying the bar code "signature" in one embodiment of the present invention;

1   Figure 8 is an illustration of an exemplary bar code bill payment "signature" in

2 one embodiment of the present invention;

3   Figure 9 is a table illustrating the results of an exemplary split modulus matching

4 calculation in one embodiment of the present invention;

5   Figures 10 and 11 are illustrations of an exemplary Level 3 envelope in one

6 embodiment of the present invention;

7   Figures 12 and 13 are process flow interaction diagrams of the mainline

8 transaction information interchange between the checkout scanner, retailer host

9 processor, and data collection network interface (DCNI) unit in processing a bar coded

10 customer bill remittance stub, in one embodiment of the invention;

11   Figure 14 is a system view diagram of a transaction collection system in one

12 embodiment of the present invention;

13   Figure 15 is an exemplary transaction processor executive controller (TPEC)

14 display screen, in one embodiment of the invention;

15   Figure 16 is an exemplary system monitor station (SMS) display screen, in one

16 embodiment of the invention;

17   Figure 17 is an exemplary end of batch monitor (EBM) display screen, in one

18 embodiment of the invention;

19   Figure 18 is an exemplary electronic transmission interface (ETI) display screen,

20 in one embodiment of the invention;

21   Figure 19 is an exemplary ETI transaction detail display screen, in one

22 embodiment of the invention;

1   Figure 20 is an exemplary ETI map biller-to-partner display screen, in one

2   embodiment of the invention;

3   Figure 21 is an exemplary transaction browser display, in one embodiment of the

4   invention;

5   Figure 22 is a process flow diagram of another exemplary bill payment system

6   consistent with the present invention;

7   Figure 23 is an illustration of an exemplary Level 3 envelope in one embodiment

8   of the present invention;

9   Figure 24 is an exemplary bar coded deposit slip in one embodiment of the

10   present invention;

11   Figure 25 is an illustration of an exemplary gas station/convenience store debit

12   card known in the art; and

13   Figure 26 is an illustration of an exemplary gas station/convenience store debit

14   card in one embodiment of the present invention.

15   **DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS**

16   Biller-Payor Embodiments

17   Turning now to Figure 5, a bar coded bill payment based system 500 consistent

18   with the present invention utilizes a bar code on the biller invoice, which is then delivered

19   to the customer via mail, and payment information and payment credits are returned to

20   the biller electronically. Advantageously, nationally recognized and federally sanctioned

21   payment electronic networks may be utilized for remitting customer payment data and

22   funds. For all the goods and services rendered to a customer over a given billing period,

23   the biller's accounts receivable 501 accumulates a dollar total and generates a detailed

1   machine printed invoice including a special bar code, which is mailed to the customer

2   503 via U.S. Mail 502. Time for processing and mailing may be 4-5 days after account

3   cut-off time, and the mail transit time to the customer may add an additional 2-3 business

4   days or more before the customer receives the invoice (which time is variable, without

5   any direct traceability from the perspective of either the biller or the customer). The

6   customer 503 then receives the invoice in the mail. Sometime later when cash resources

7   are available, or depending on other factors, the customer 503 decides to pay bill. The

8   time for this to occur is variable, depending upon the customer's circumstances.

9   To pay the bill, the customer 503 takes the bar-coded invoice to a participating

10   store (e.g. a supermarket) that processes bill payments. The customer presents his bar-

11   coded bill remittance stub to the checkout cashier for scanning at the checkout scanner

12   504, which may be done while paying for other UPC-coded items. Instead of looking up

13   an in-house UPC code for pricing, the scanner 504 picks up the bill payment bar code

14   that identifies the biller to be paid and the account number to be credited. The customer

15   informs the checkout cashier the amount to be paid on that account, payment is tendered

16   to the cashier, and the cashier inputs the amount to be paid into a terminal which is in

17   communication with a backend host processing system 505. Upon receiving payment

18   from the customer, that bill payment is then complete. The check out of any remaining

19   products and items (or bills) continues until the complete total for all goods and services

20   is calculated. The customer may receive a printed receipt of the payment tendered with

21   date and time that the payment was made. The backend host processing system 505

22   forwards all the payment data to the data collection network interface 506 ("DCNI").

23   The processing time for all of the payment steps may be as little as a few seconds.

1   Moreover, payments made in this manner are time-stamped, so that once payment is

2   made, the customer may rest assured that payment has been timely acknowledged.

3   The data collection network interface 506 collects and stores all the customer

4   payment data in non-volatile memory. Periodically throughout the day (based on time

5   and transaction volume thresholds), or at other predetermined intervals, the interface 506

6   transmits the payment data to the central site transaction collection system 507.

7   Additional transmissions may be scheduled before the daily transaction collection system

8   507 aggregation times. The time for the back-end and collection system processing has

9   no impact on customer payment time, since all payments may be time-stamped.

10   Separately calculated calendar day payment counts and totals may also be sent to the

11   transaction collection system 507 as an independent transaction audit balancing

12   mechanism. The transaction collection system 507 may continuously receive payment

13   data information from a distributed network comprising a plurality of data collection

14   network interface units 506 deployed at field retail establishments. Before the last

15   processing window closes at the Federal Reserve Automated Clearing House (ACH)

16   Network 508, all customer payments are sorted and aggregated for direct remission to

17   their respective billers, which may take approximately an hour. Processing and

18   distribution of electronic payment data is done using the Federal Reserve Automated

19   Clearing House (ACH) Network 508, which may take 6-9 hours. At the biller's bank

20   509, the electronic payment data is received from the ACH Network, stripped and

21   reformatted according to biller specified formats, which may take 4-6 hours. Finally, the

22   biller's accounts receivable 501 and/or customer service computer files are updated.

1   Depending on the "legacy factor" of the biller's computer processing systems, this

2   process can range anywhere from 2-3 hours to 4-5 days.

3   Assuming zero latency on the part of the customer paying his bill, the cycle time

4   between the customer account cut-off time and the time that the customer payment is

5   applied to his account, using the above time estimates, may range from 9-12 days (in

6   contrast to the 13-18 days of the prior art system). Since there is usually some customer

7   delay, the observed bill payment cycle time will be longer.

8   Moreover, if the biller recognized the customer payment date and time as the

9   creditor date of receipt as specified in the Federal Reserve Regulation Z, Section 226.10,

10   then the total bill payment cycle time would be reduced to 6-8 days. Explicit agreement

11   from the biller would be secured through the biller registration process. The biller may

12   validate the customer payment date with the transaction embedded "electronic postmark",

13   which can not be performed within the current frameworks of either the paper based bill

14   payment or the electronic payment paradigms, today.

15   In addition to the more than 55% time reduction in the bill payment cycle, other

16   advantages of the present invention include: customer choice of local bill payment

17   locations, electronic application of bill payments to account within 24-36 hours, a

18   reduction in bill payment errors with machine-readable bar coded account numbers, and

19   time stamping of bill payments at the time payment is tendered. Electronically delivered

20   bill payments, under the present invention, are much cheaper for the customer to pay for

21   and less expensive for the biller to process through its remittance processing center and

22   accounts receivable systems than under a prior art system. Additionally, banks that

23   process data from the ACH system will have more chargeable services to offer their biller

1 customers. Furthermore, billers can incorporate this bar coding standard into their bill

2 remittance processing centers, as older OCR recognition equipment is replaced with

3 simpler and more reliable laser bar code scanning equipment. With sufficient planning, a

4 biller, contemplating a conversion of one or more legacy customer account numbering

5 systems to a simpler, newer scheme, can use this system of bar coding in its conversion

6 process. In an alternative embodiment, electronic invoice delivery, whereby the customer

7 receives and prints the bar-coded invoice at his own computer system, may be used to

8 reduce the time and labor required for the biller to prepare and mail invoices to the

9 customer.

10 It is further contemplated that billers would register with a centralized

11 organization in order to receive an assigned biller bar code, just as all companies must

12 register with the Uniform Code Council (UCC) to get their Universal Product Code

13 (UPC) assignment for their products.

14 It should be understood that the foregoing described embodiment which uses the

15 in-store scanner and retail host back-end machine as a means of detecting, reading and

16 processing the bill payment bar codes is but one embodiment, and these components are

17 not described herein as limitations. For example, another method might utilize a personal

18 computer, terminal, or other equipment having a bar code capable scanner, receipt printer

19 and an interface to the data collection network interface in place of the in-store system.

20 Ideally, such a computer would have the same functionally equivalent interface as the in-

21 store system. In fact, it is contemplated that, as a transitional measure, until the retail

22 stores modify or update their in-house check-out software systems to accommodate the

1   data collection network interface, a simple PC might operate in its place and serve as a

2   model prototype to demonstrate the operational aspects of this system.

3   Bar Coding Validation

4   Prior art systems have concentrated on the visual aspects of bill remittance stub

5   recognition, detection and validation against potential fraud, typically using optical

6   character recognition (OCR). The present invention applies a bar code solution to the

7   general bill payments problem, rather than a new variant or improved OCR technique.

8   Bar code is more efficient than OCR by several magnitudes because bar codes can be

9   detected reliably and processed by relatively simple hardware and firmware, whereas

10   OCR requires long physical scan times and significant host CPU processing requirements

11   for character recognition (and then only for a selected set of fonts). Bar code consists of

12   binary elements that are parity checked for every bar code symbol and globally checked

13   digited at the message level. OCR consists of many analog segments that have to be

14   neurally correlated and matched to the human readable character set with no internal self-

15   checking controls. In short, bar code is the future digital solution whereas OCR is a dated

16   analog solution that still plagues most bill payment processes today.

17   The Universal Product Code (UPC), printed on most retail products today, is a 12-

18   digit number that is a concatenation of four numeric fields - a classification number (1), a

19   producer identification number (5), a product identification number (5), and a check digit

20   (1). The need for a standards authority first arose in 1972 when the supermarket industry

21   decided to mark each of the grocery point-of-sale packages with a unique identifier to

22   speed checkout transactions, therein creating an organization that today is called the

23   Uniform Code Council (UCC). The underlying bar code symbology is merely a

1 convenient representation of this UPC code format that can be reliably detected by simple

2 point-of-sale scanning equipment (thus, it does not matter which particular bar code is

3 used).

4 There is no standard way of representing multiple data fields in a single scan line,

5 given the designs and formats of various bar code standards and conventions commonly

6 in use today. For a typical bill payment application, two fields are minimally required - a

7 6-7 digit biller identification and a variable length (up to 22 characters or more)

8 alphanumeric customer account number. If these fields were concatenated in a fixed

9 format in a single bar code scan line on a bill head, it is very doubtful that low skilled

10 retail help would reliably scan the correct bar code where multiple bar codes might

11 appear on a given bill head. To perform error-free data validation on this scan line, more

12 information must be embedded within the data itself.

13 In the retail environment where bar coded products abound, there is a distinct

14 need to determine that a bar code, submitted for processing, is correct and valid for the

15 target bill payment processing application. One cannot assume that the retailer will

16 always submit a valid bar code from a bill remittance stub that may contain more than

17 one printed bar code sequence. If, for example, a utility company prints the new bill

18 payment bar code, in addition to an already existing internal routing bar code, the two bar

19 codes must be disambiguated. While the utility company can easily distinguish its own

20 internal routing code by its printed position on the bill remittance stub, a retail cashier

21 might not know which to present. The solution is for the cashier to use trial and error. If

22 the first bar code attempted does not validate, the second (or third, etc.) should be

1   scanned. Validating a bar code bill payment "signature" in the course of the bill payment

2   process is a component of an embodiment of the present invention.

3   By using a unique bar code "signature" having multiple levels of data validation

4   implemented by check digit algorithms, a bar code scanning system may reliably

5   recognize and validate a valid bill payment bar code. The concept of paper envelopes

6   may be used as an analogy for relating the validation method of the invention. In the

7   embodiment described herein, three "envelopes" are used (although those skilled in the

8   art will recognize that any number of "envelopes" or levels of validation may be used),

9   the first being inside the second, and the second inside the third. At the outermost layer,

10   the third "envelope" has printed, on the outside, the bill payment bar code "signature". If

11   the bar code is detected and read correctly by the hardware scanner, the resulting

12   alphanumeric information is valid in that it compared correctly with the embedded

13   encoded bar code check symbol. If this first operation is successful, the "envelope" is

14   opened. The directions printed on the inner "envelope" specify to calculate a check digit

15   on the resulting alphanumeric information derived from the bar code, comparing the

16   calculated result against the last digit in the string. If this second operation is successful,

17   the next "envelope" is opened. The printed directions on the innermost "envelope"

18   specify to use the format designator digit(s) to decode and to verify the data integrity of

19   the embedded component data elements. Each of these data elements should be verified

20   by calculating their check digits and by utilizing other independently available data

21   validation checks.

22   If all three levels of validation successfully pass muster, then a valid bill payment

23   "signature" has been detected and the resulting data should then be passed to the target

1   bill payment application for subsequent processing. Failure at any intermediate

2   validation level results in a negative acknowledgement. The prime purpose of this bar

3   code "signature" design is to unconditionally identify the detected scanned bar code as

4   being proprietary to the present invention, in the absence of any other external

5   information, through multiple layers of check digit information, format designator

6   indicators and local data validation schemes.

7   A number of different application "signature" formats may be implemented

8   within a bar code scan line as a series of successive embedded "signature" data fields. In

9   one embodiment, each signature data field consists of three elements: a format designator

10   ("fd") consisting of one or more digits, a data field ("data") consisting of one or more

11   fixed or variable length sub-data fields, and a check digit ("cd") algorithm associated

12   with the format designator and the level at which it appears.

13   Figure 6 illustrates a bar code "signature" 600 in one embodiment of the

14   invention, utilizing four levels of successive embedded "signature" data fields. The

15   Level 1 data validation 601 is simply the hardware decode of the bar code symbology,

16   using the embedded check symbol character as data validation – i.e., all the bar code

17   symbols were detected and processed correctly. Applicability of the data to the intended

18   target application is demonstrated when all the remaining levels of validation are

19   successful. As shown in Figure 6, Level 2 data validation 602 consists of one signature

20   data field (although it could have had more). The data validation of the Level 2 signature

21   data field consists of two checks – that the format designator value (for that level) is

22   correct and that the check digit calculation for the data string consisting of the format

23   designator digit(s) and the data field digits matches the check digit character. The Level

1   2 format designator defines at least three characteristics: the check digit algorithm

2   implementations (in this example, 1), the number of data elements (in this example, 1),

3   and the number of trailing discard characters for bar code odd / even count padding (in

4   this example, 2). The number of unique combinations of the above three characteristics

5   will determine the number of format designator values required at this level. For this

6   example, there is only one check digit algorithm to disambiguate target applications,

7   there is only one data field element, and there are two padding character combinations for

8   the Code 128 bar code. Thus, the total number of format designator values required at

9   this level is two.

10   The Level 3 signature data field 603 checks operate on the residual Level 2 data.

11   The Level 3 data validation checks are similar to the Level 2 checks and the format

12   designator defines at least these three characteristics: the check digit algorithm

13   implementations (in this example, 1), the number of data elements (in this example, one

14   fixed, one variable or fixed), and the field lengths for one or more data elements. As

15   shown in Figure 6, there are two data element fields. The number of data splits defined

16   for this data field would determine the number of format designator values that are

17   required for this level.

18   The fourth 604 to nth 605 levels comprise a continuing iterative process of Level

19   3. Depending on the attributes or properties that one arbitrarily assigns to the data (and

20   hierarchical functions) at each level determines the number of format designator values

21   required at that level. The target application receives all the data fields from the final

22   level of data validation.

1   A carefully chosen set of conventions for the format designators at each level will

2   facilitate correct data field parsing with the additional security that multiple levels of

3   check digit validation will ensure data integrity and "positive ownership" to the target

4   application. The format designator digit(s) do not necessarily have to be leading as

5   illustrated above. An alternative format for the leading format designators could be as is

6   illustrated in the bar code signature 700 of Figure 7, in which the data strings precede the

7   format designator digits.

8   With reference to the exemplary embodiment shown in Figure 6, a sample format

9   of the unique bar code bill payment "signature" 800 is shown in Figure 8, as a multiple

10   layered data validation scheme. A bar code typically consists of 6 sections: (1) a quiet

11   zone (~ 0.25" of white space) before the bar code; (2) a unique bar code symbol that

12   represents the "START" character; (3) bar code symbols representing data characters

13   (1300017350764058410363); (4) bar code check symbol that represents a calculated

14   check digit of the preceding data character block; (5) a unique bar code symbol the

15   represents the "STOP" character; and (6) a quiet zone (~ 0.25" of white space) after the

16   bar code. If the hardware decode of this Level 1 envelope data string is not successful,

17   the retail cashier should not get a good bar code scan confirmation. If the hardware

18   decode is successful, the retailer cashier should get a good bar code confirmation (but not

19   necessarily of a valid product code). A good hardware decode of a bar coded scan line is

20   defined as the detection of valid bar code symbols within the string that, when processed

21   through the defined check digit algorithm, matches the embedded string check symbol

22   character. This is the first level of data validation check that must pass.

1   When the bar coded data characters are decoded from this scheme of variable

2   width white and dark bar patterns, the result is the following string of (alpha)numeric

3   characters: 13000173507640584 1036 3. Calculating a split modulus 10 check digit for

4   the string to match against the last character, using a 1313… mathematical weighting

5   scheme, results in the table of calculations illustrated in Figure 9. The Level 2 format

6   designator value (1) is chosen to indicate the check digit algorithm (Split Modulus 10

7   with mathematical weights of 1313…), the number of data field elements (1), and

8   number of trailing padding characters (0) to utilize the high density Code 128 Type C

9   symbol set. The Level 2 format designator value (2) is chosen to indicate the check digit

10   algorithm (Split Modulus 10 with mathematical weights of 1313…), the number of data

11   field elements (1), and number of trailing padding characters (1) to utilize the high

12   density Code 128 Type C symbol set. The modulus (or the remainder) of the resulting

13   sum of the digits (87 divided by 10) yields 7. The complement of the remainder 7 yields

14   3 (10-7=3). This calculated result is the check digit of the above digit string, and

15   successfully matches the last digit in this illustrative example. This is the second level of

16   data validation check that must pass. If this validation is successful, the operation

17   proceeds to the Level 3 envelope data decode and validation algorithms.

18   In this particular example, there are only three levels of validation defined. The

19   Level 1 check is a hardware validation data check. The Level 2 check is a pre-qualifying

20   software validation data check. The Level 3 check is an "ownership" data check (i.e.

21   whether this is the "signature" for bill payment data under the present invention).

22   Different "signatures" can be constructed for any number of application program uses

23   through a judicious design scheme and the selection of format designators. Format

1 designators are arbitrary indicators with which to properly decode the format of and to

2 validate the ensuing data string – in this case, the format designator is placed as the first

3 (one or more) leading digit(s). At different levels, the same format designator values can

4 have different meanings.

5 Turning now to Figures 10 and 11, two format designator values have been

6 chosen in this example (at Level 3) to encapsulate six format and validation data

7 characteristics – all of which must be correct for the third and final data validation check

8 to pass. The Biller ID in each of these examples is "173" in a 6-digit numbering system.

9 The embedded spaces in the encoded data examples 1000 and 1100 of Figures 10 and 11

10 are not significant and are inserted to show more clearly the various fields within the

11 example digit strings. The six format designator characteristics shown in Figures 10 and

12 11 define either format (1,2,4,5) or data validation (1,2,3,6) checks. A format

13 characteristic defines the layout of the data whereas a validation characteristic facilitates

14 data checking. To validate a unique bar code application program "signature", the more

15 dependencies that exist within the data at each level for subsequent cross checking and

16 validation, the better. In the illustrations of Figures 10 and 11, there are two format

17 designator examples with all possible variants within several constraints that are checked

18 and validated. Where there might be several different Level 2 check digit algorithms

19 employed, a Level 3 dependency is checked. Condition #1 is checked against valid range

20 of format designator values for the current Level (in this case 3, 4). Biller Identification

21 Number (in this example, 173) is determined if Condition #3 is TRUE and if it exists

22 within the list of current and valid billers (an independent table acquired by another

23 means). Where the biller account number check digit algorithms are not known, a check

1   digit is calculated and added to the account number – to be checked then stripped when

2   presented to the biller (Format Designator Value = 4). Where the biller account number

3   check digit algorithm is known, it is checked against biller defined specifications (Format

4   Designator Value = 3): Conditions #1, #6. Within the Level 3 envelope for each of the

5   above examples, the decoded and check digited values of the Biller Identification

6   Number and the presented Biller Customer Account Number results are as follows: For

7   Format Designator Value = 3, Biller ID = 173, Customer Account = 07640584103; and

8   for Format Designator Value = 4, Biller ID = 173, Customer Account = 0764058410.

9   This is the third level of data validation check that must pass. If all the components in the

10   Level 3 envelope test and compare successfully, then the unique bar code bill payment

11   "signature" has been correctly validated for further processing, and an indication is given

12   to the retailer or cashier that a dollar amount payment should be entered for this item.

13   The primary purpose of this bar code "signature" design is to unconditionally

14   identify the detected scanned bar code as being proprietary to a system or method

15   according to the present invention, in the absence of any other external information, and

16   to validate (using mathematical formulae and/or independent table look-up methods, if

17   possible) all the data element components therein.

18   The methods and procedures by which the format designator concept could be

19   extended are strictly an implementation issue of design schemes and an adopted set of

20   orthogonal convention(s). While the foregoing illustrative working example uses only

21   three levels of "envelopes" to validate the unique bar code bill payment "signature", more

22   levels could have been used, as required. The format designators in the foregoing

23   example utilized a fixed data format with a set of predefined check digit algorithms for

1   each level. Possible design extensions in further embodiments might include: (1) a

2   format designator design scheme that defines a dynamic variable number of sub-field

3   elements and/or a set of dynamic component string lengths for each of the defined set of

4   the sub-field elements (in contrast to the foregoing illustrated predefined fixed schemes);

5   (2) a format designator design scheme having more than one digit in length, wherein each

6   digit specifies an independent set of predefined orthogonal attributes that can be

7   combined in a mix-and-match fashion (e.g. a two digit format designator would specify a

8   primary set of attributes in the tens digit that is qualified by a secondary set of attributes

9   in the units digit); and (3) format designator design schemes wherein subsequent trees of

10   sub-field elements are controlled by one or more preceding levels of format designators.

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Bar Coding Specifications

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12   The bill payment application bar code printed on each bill remittance stub might

13   minimally consist of four basic fields, printed as a single string of digits: a format

14   designator (1 digit); a biller identification number with optional embedded check digit (7

15   digits); a customer account number with optional embedded check digit (22 digits); and a

16   check digit of the previous three fields (1 digit). Of course, those skilled in the art will

17   recognize that the number of fields and/or digits per field as described herein is specified

18   by way of example, and not limitation, and that the number and length of fields may vary

19   according to each embodiment of the invention. In this example, the outermost bar code

20   envelope for this information conforms to documented ISO bar coding convention

21   standards, utilizing an embedded check digit algorithm to verify the integrity of the entire

22   bar code scan line data. It is strongly recommended that the biller defined customer

23   account number also contain an embedded check digit, as a prudent secondary validation

1   measure. If an embedded check digit does not already exist within the biller customer

2   account numbering scheme (or the biller does not wish to disclose that information as

3   being company proprietary), an alternate account number format provides a temporary

4   check digit that is checked then discarded before presentment to the biller. If the detected

5   bar code scan line data correctly passes the triple tiered and multiple embedded check

6   digit calculations, this mechanism will virtually guarantee "defect free" biller and

7   customer account data. Otherwise, a bill payment stub whose bar code has been

8   mutilated or defaced by the customer is immediately rejected at the point-of-sale entry.

9   To accommodate future requirements, an expanded set of format designators

10   could define new data format structures or redefine the characteristics of current data

11   fields. The following is a possible list of characteristics that a format designator element

12   might define within a digit string: number of sub-field elements; component string

13   lengths of one or more of these sub-field elements; check digit algorithms to be applied to

14   each of the sub-field elements; odd/even string packing factors when a single bar code

15   character represents one or more digits (Code 128 is a good example of this compression

16   feature); or subsequent trees of dependent sub-field elements. These format changes

17   would be transparent to the end user. The bar code data, detected by the retail checkout

18   scanner, is passed directly to the data collection network interface unit for secondary

19   validation and translation. The parsed "translated" form of this data is then passed back

20   to the back-end host processor system for completing the bill payment transaction at the

21   checkout counter.

22   The bar code might either be printed vertically on the left (bottom to top) or right

23   (top to bottom) hand side of the bill remittance stub with sufficient surrounding white

1   space to satisfy the criteria of the ISO bar code format. If there are other proprietary bar

2   codes present on the bill remittance stub, the checkout counter cashier could have the

3   option of folding or bending the bill remittance stub such that only the required bar code

4   is visible for a successful bar code scan of the bill payment information. Vertically

5   printed bar codes of the format designator, biller identification number and the customer

6   account number on most bill remittance stubs is good for a combined number sequence of

7   14-25 digits at the lowest common denominator bar code print resolution (nominal bar

8   code "X" dimension $\geq$ 0.010 inches and total bar code string length $\leq$ 3.0 inches). For

9   sequences longer than that, it is recommended that the bar code sequence be printed in a

10   manner parallel to the horizontal OCR line such that extraneous proprietary bar code

11   information can be folded out of the way for a successful scan.

12   The assigned biller identification number is acquired or distributed from a central

13   registry authority, akin to the manner in which the Uniform Code Council assigns new

14   producer identification numbers. As far as the customer account number is concerned, it

15   is recommended that the biller include a check digit within the account numbering

16   scheme. While it is unlikely that a customer account number would be read in error if the

17   hardware bar code check symbol scan validates, this additional check digit provides

18   double assurance to the biller that the customer account number is correct. This is

19   especially important from the biller's point of view when accepting bill payments from

20   many sources of ACH submitted data, many of which may be human entered from the

21   myriad of home banking software packages available - known empirically to have very

22   high human input error rates.

1   To this point, it has been tacitly assumed that the biller will want to print this new

2   bar code on the face of his bill remittance stub. However, technical, as well as political,

3   reasons could preclude the printing of a new bar code standard on the face of the current

4   bill remittance stub. An alternative option might be for the new bar code format to be

5   printed on the back of the current bill remittance stub (so as not to disturb the current

6   mode of visual remittance processing) or printed on a second or subsequent tear-off bill

7   page, formatted for that specific purpose. A further alternative would be to utilize a

8   specially printed bar code format enclosure page (printed on better and sturdier paper

9   stock) that would permit multiple reuse by the customer. Spare space on that enclosure

10   could even be sold for advertising to defray the printing costs by the biller.

11   The most common point-of-sale bar code used throughout the retail industry is the

12   UPC-A variant. However, most scanners employ an internal firmware auto-recognition

13   mechanism that permits them to detect and to read several bar code symbologies. The

14   bar code symbology, under current consideration for the most general specification of an

15   alphanumeric customer account number, is the Code 128 family. Where there are only

16   numerics, the Code 128 Type C variant features a high-density bar code – one printed

17   symbol per two digits of information. During the checkout aisle scanner process, the

18   back-end host processor recognizes a bar code data scan line as a valid bill payment

19   transaction and requires the cashier to enter an amount to be paid. When this amount is

20   entered, a fixed transaction fee is added to the bill payment amount. On the printed

21   customer receipt, the bill payment is recorded in a form similar to the following,

22   including biller name and account number, amount paid, transaction ID, date and time,

23   and transaction fee charged:

```
1    PMNT:  Biller Name
2    ACCT:  Customer Account Number
3    AMNT:  $ ddd.cc
4    TRID:   rrrrrr yjjj ssss
5    DATE:  mm/dd/yy  hh:mm
6    FEE:     $ dd.cc
7
```

8   This time-stamped transaction data is then stored in the data communication

9   network interface unit for later transmission to the transaction collection system.

10   Where the checkout scanner detects multiple bar codes, the retailer cashier can be

11   trained to recognize the placement of a valid bill payment "signature" bar code to be

12   scanned for the proper processing of a customer payment. Scanning any other bar code,

13   present on the bill remittance stub, that does not pass all of the bill payment "signature"

14   tests results in an immediate validation reject by the data communication network

15   interface unit.

16   <u>Back-end Host Processor</u>

17   The retailer back room host processor may be required to support two well-

18   defined interfaces, the front-end checkout counter scanner system and the back-end data

19   collection network interface. When the Code 128 bar code format is encountered from

20   bill remittance stubs, it should be recognized as a customer bill payment, rather than the

21   UPC code for a customer selected product. This decision can be performed in a number

22   of ways by the back-end host processor. The easiest logic path to implement within the

23   back-end host processor is as follows: if this bar code scan is not recognized as one of

24   several defined pre-programmed sequences, pass it to the data collection network

25   interface before rejecting the scanned data completely. The back-end host processor

26   passes the complete scan line data to the data collection network interface unit for

1 secondary level validation and data translation. If secondary level validation is

2 successful, the parsed translated data is passed back to the back-end host processor to

3 complete the processing for this bill payment transaction. In this case, the returned

4 translated data consists of the Biller Name, the Customer Account Number, and

5 Transaction ID that is printed on the customer printed receipt.

6   As bill payment data is processed by the front-end checkout scanner system and

7 completed, it may be relayed by the back-end host processor to the data collection

8 network interface unit to be stored in non-volatile memory for later transmission to the

9 central transaction collection system. There are a number of standard data collection

10 network interface functions that may be accessed by the back-end host processor system,

11 e.g. validating the biller name, adding a transaction, voiding a transaction, printing daily

12 or weekly processed totals and reports, and setting or reading operational configuration

13 parameters.

14   Data Collection Network Interface (DCNI) Unit

15   The retailer on-site data collection network interface unit should provide a well

16 documented, protocol neutral features and functions front-end interface to the retailer

17 back-end host processor. The DCNI should also provide a non-volatile memory storage

18 capability of accumulated customer bill payment data. This may be accomplished with a

19 solid state hardware design that is electrically isolated at all the critical interfaces and has

20 no moving elements that mechanically wear and eventually cause the unit to fail. The

21 back-end of the data collection network interface should provide a transparent interface to

22 the central site transaction collection system and include functionality such as: (1)

23 performing secure validation procedures with the transaction collection system; (2)

1   downloading DCNI unit operating system and program application code firmware; (3)

2   downloading DCNI unit operational configuration parameters; (4) uploading DCNI unit

3   memory image (emergency and debug use); (5) downloading Verification Biller ID and

4   Name data; (6) uploading transaction data (compressed & encrypted); and (7) setting

5   DCNI unit system date or time. The primary function of the data collection network

6   interface unit is to provide a set of support functions to the retailer host processor to aid

7   in the collection, validation and storage of transaction data from customer bill remittance

8   stubs scanned at the checkout counter.

9   Figures 12 and 13 illustrate the mainline transaction information interchange

10   between the checkout scanner, retailer host processor, and DCNI unit in processing a bar

11   coded customer bill remittance stub, in one embodiment of the invention. As shown in

12   Figure 12, the interaction occurring in the case of a valid account number begins with the

13   bar code being read 1201 by the checkout scanner and passed to the retailer host

14   processor. The host processor next validates the bar code 1202 and passes the resulting

15   data to the DCNI. Since the account number is valid, an acknowledgment of validity

16   (ACK) is returned 1203 via the host processor to the checkout scanner, along with the

17   biller name and account number. The amount to be paid is queried 1204 at the checkout

18   scanner, and the amount entered is passed 1205 to the retailer host processor, which

19   passes 1206 the bar code data and the amount entered to the DCNI, where this transaction

20   data is stored 1207. If the data store is successful, an acknowledgment is sent 1208 via

21   the host processor to the checkout scanner, along with a transaction ID number. The

22   checkout scanner may then print 1209 the biller name, account number, and transaction

23   ID as a transaction receipt. As shown in Figure 13, in the case of an invalid account

1   number, the checkout scanner first reads the bar code 1301 and passes it to the retailer

2   host processor. The host processor next validates the bar code 1302 and passes the

3   resulting data to the DCNI. Since some aspect of the data passed to the DCNI is invalid,

4   an acknowledgment of invalidity (NAK) is returned 1303 to the host processor with a

5   reason code. The Reject Payment status, passed to the checkout scanner 1304 from the

6   host processor, may or may not contain the DCNI reject reason code for human feedback.

7   Reason codes might include, e.g., invalid scan line (not a valid bill payment "signature"

8   scan line), Biller ID check digit error, invalid Biller ID (old biller that is not serviced

9   anymore), or Biller Customer Account Number check digit error. Payment is

10   consequently rejected at the checkout scanner 1304.

11   In one embodiment, the Transaction ID that is returned to the retailer back-end

12   host processor, as a positive confirmation that the transaction data has been accepted and

13   successfully stored, is a 15 digit number consisting of: DCNI unit identification (7 digits),

14   last digit of year (1 digit), Julian date (3 digits), and transaction sequence number (4

15   digits). This information may be printed on the customer receipt as three groups of digits

16   (7,4,4) as an ease-of-use issue, should it be necessary for the consumer to dictate his

17   Transaction ID to a customer service representative over the telephone.

18   Periodically throughout the day (primarily based on time and transaction volume

19   thresholds), the DCNI unit should transmit its stored data to the transaction collection

20   system after it has aged past the "transaction void" window. The "transaction void"

21   window is defined as the time past which the transaction cannot be canceled after it is

22   taken (e.g. 15 minutes to eliminate the possibility of fraud). In one embodiment, the data

23   elements of each transaction transmitted to the host consist of the following: Retailer ID,

1   Biller ID, Biller Account Number, Amount Paid, Sequence Number, Transaction

2   Date/Time Stamp, Status as Active or Void, and Operator ID. When these transactions

3   are transmitted to the transaction collection system, they may be sent in batches whose

4   batch name conforms to the following naming convention: DCNI unit identification (7

5   digits), last digit of year (1 digit), Julian date (3 digits), and last transaction sequence

6   number in batch (4 digits). Such a numbering convention makes it easier for customer

7   service operations personnel to trace a given Transaction ID.

8   The design and implementation of the data communication network interface

9   functions could optionally be performed as a real time on-line system or as a batch

10   oriented system to the transaction collection system. If implemented as a real-time

11   system, communication costs to the central site and a redundant "hot cutover" central site

12   hardware configuration is very expensive, by comparison, to eliminate all single point

13   equipment failures in an overall system operation. A central site batch oriented "hot

14   backup" system eliminates the real-time aspect of transaction processing that

15   exponentially escalates costs. Central site redundant hardware still has to be available,

16   but much less of it is required to achieve the same level of system operation reliability.

17   In systems that are explicitly designed for real-time operation (e.g. credit card

18   verification), "hot cutover" systems contain elements that have to be designed, a priori,

19   into the combination of system and application software to anticipate and to detect the

20   many types of potential system, application or equipment failures. When detected,

21   transaction processing is immediately and automatically transferred to an operational

22   system "in waiting". In the ensuing recovery mode precipitated by this equipment switch

23   over, transactions, in transit at the time of the first system failure, are either pushed

1 through to completion (if past a defined system bottleneck check point) or are pulled

2 back. If a transaction is pulled back, all database record modifications are restored and

3 then the transaction is reprocessed from ground zero.

4 "Hot backup" designed systems have fewer constraints. Spare equipment is

5 powered up and ready to be switched into operational mode. While time is important, it

6 is not as critical in this situation. In one embodiment, the DCNI unit resubmits

7 transaction batches, not explicitly acknowledged as processed, at a later time (ranging

8 from minutes to hours). Subsequently, if duplicate transactions are encountered on

9 resubmission, they are not processed but are acknowledged as such to the DCNI unit.

10 Much less premeditated contingency system software is required in this environment for

11 robust system operation.

12   Transaction Collection System

13 While the data collection network interface may be a single unit, the central site

14 transaction collection system may consist of multiple central processor server units acting

15 in concert to perform a collective set of functions and processes. This design approach

16 permits scaleable processing and avoids the possibility of single point failures that might

17 curtail or impact the production processing of incoming transaction batches.

18 Figure 14 illustrates one possible configuration for the transaction collection

19 system 1400. In the embodiment shown, incoming encrypted data files from the field

20 data collection network interface units would come through a dial-up network or modem

21 bank 1401 over a T1 or similar connection 1402 into an entry router 1403 outside the

22 central site firewall, via a channel service unit/data service unit 1404 (CSU/DSU) or other

23 similar device for providing isolation between the network and the on-premises

1 equipment. Parallel firewall machines 1405, one operating in "hot back up" mode, filter

2 the inbound data traffic from validated and secure data sources. In addition to their

3 primary security role, one of the ancillary functions of the firewalls 1405 is to load

4 balance the data traffic across all available file transfer protocol (FTP) engines 1407. A

5 plurality of FTP engines 1407 are shown in the diagram as being in a scaleable multi-

6 server configuration, coupled via one or more integration hubs (e.g. 100 MB or 1 GB

7 Ethernet hubs) 1425. The FTP engines 1407 provide the raw computing power to

8 transfer data packets from the firewalls 1405, to coalesce the data packets into data files

9 and to write them to the FTP storage server 1408, which may comprise RAID (redundant

10 array of inexpensive disk) storage or similar mass storage.

11 In the FTP storage machine 1408, a monitor process scans for completed inbound

12 files to process. Upon finding such a file, the file decryption keys are fetched from the

13 central transaction collection server 1410 and the file name is packaged in a message

14 packet that is sent to one of a plurality of transaction processor (TP) engines 1409 in a

15 scaleable multi-server configuration, coupled via one or more integration hubs 1425. It is

16 noted that the transaction processor engines 1409 and FTP engines 1407 may optionally

17 be provided with a console switching unit 1460 for sharing a single console (e.g. monitor,

18 mouse, keyboard) across the plurality of engines 1407, 1409. A transaction processor

19 engine 1409 (TPE), upon receiving this message packet, then has sufficient information

20 available to locate, to decompress and to decrypt the inbound data file into its component

21 data record types. The various received data record types are stored in a database (e.g.

22 Structured Query Language, or SQL) on the transaction collection server 1410. The

23 transaction collection server 1410 database is configured across several partitioned sets of

1   physical hardware 1411 set up for RAID storage operation. The primary purpose for

2   spreading the databases over several pieces of physical and logical hardware and/or

3   software is to avoid having single points of data congestion and equipment failure. The

4   transaction collection server 1410 database is the destination for all the data collected at

5   all the retail processing locations. On a scheduled production basis, the data is

6   aggregated and sorted, according to the biller identification associated with each

7   transaction customer account number. ACH transaction files are prepared and formatted

8   by biller identification, which then maps into biller-designated destination ABA bank

9   routing and bank account numbers.

10   The administrative/data reporting server 1420 provides access to a copy of the

11   production data for back office operations and monitoring by one or more work stations

12   1427, without burdening the front end collection system. In the embodiment shown, the

13   "glue" that holds the whole network together is one or more 100 MB or 1 GB Ethernet

14   hubs 1425. This technology provides the foundation cornerstone by which various

15   elements of the network communicate with each other and access each other's mass

16   storage as local devices. The web/fax server 1430 provides on-demand reports to

17   retailers through a web server application. It also provides periodic reports to retailers

18   that can be faxed out through the normal public telephone network 1445. The electronic

19   transmission interface (ETI) machine 1440 prepares the data that has been accumulated

20   and processed by the transaction collection server 1410 for transmission to the Federal

21   Reserve ACH Network. It formats the data into the correct ACH CIE (customer initiated

22   entry) format and transmits this data file to the appropriate destination bank interface. An

1   optical drive 1432, tape storage unit 1433, or other such storage means may be provided

2   for creating removable backups, which may be stored off-site.

3   In the CIE Entry Detail Record format, the following exemplary fields are

4   populated with bill payment information: AMOUNT (Field 6) is populated with the

5   Customer Payment; INDIVIDUAL NAME (Field 7) is populated with the Transaction

6   Sequence Number (which contains the Julian date of payment); INDIVIDUAL

7   IDENTIFICATION NUMBER (Field 8) is populated with the Biller Customer Account

8   Number; and DISCRETIONARY DATA (Field 9) is populated with the Payment

9   Complete Time encoded as a two digit time field ranging from 00 to 95. This number

10   may be divided by 4 to calculate military hours (decimal) to the nearest quarter hour. For

11   example, the number 26 divided by 4 would yield 6.5 (0630 or 6:30 AM). The remaining

12   fields in the CIE Record format are populated with mandatory banking information data,

13   such as biller ABA and account number.

14   A print control station 1470 is coupled to one or more print engines 1471 for

15   handling printer transmissions to one or more laser printers 1472 for a variety of report

16   and other printing functions.

17   Figure 15 illustrates an exemplary transaction processor executive controller (TPEC)

18   display screen 1500, in one embodiment of the invention. The TPEC monitor program

19   resides in the FTP storage server 1408 and is responsible for detecting complete inbound

20   data files from the field retailer based data communication network interface units. When

21   an inbound data file is detected, TPEC fetches the file decryption key from a master

22   database and then dispatches it and the data file name to one of the transaction processor

23   engine (TPE) 1409 program threads. The TPE 1409 decompresses and decrypts the

1   inbound data file and stores the component plain text data records in the SQL database

2   that resides within the transaction collection server 1410 on RAID storage 1411. As

3   shown, display screen 1500 may include features such as jobs attempted 1501 (i.e.

4   batches received) and transactions processed 1502 (i.e. individual data records processed

5   from the batches received). This display 1500 shows the current Transaction Process

6   Engine(s) batch job statistics for the system batch dated 10/12/2000 at 13:44:31. As

7   shown, TPEC is in PAUSEd State – it is not currently dispatching any detected inbound

8   data files to the TPE engines 1409. For this batch, 129 inbound data files were processed

9   that resulted in 244 data records, stored in the SQL database.

10   Figure 16 illustrates an exemplary system monitor station (SMS) display screen

11   1600, in one embodiment of the invention. This display 1600 shows that individual

12   retailers may be configured in a directory tree-like structure, with each of a plurality of

13   distributors 1601 being a parent to one or more retailer bill pay sites 1602. The directory

14   framework of retailers 1602 may conform to any convenient form of administrative

15   structure, e.g. a distributor model, based on a hierarchy of people, or a physical model,

16   based on territories with defined boundaries (states, counties, or towns). Also illustrated

17   in this display is the placement of INSTRUCTION files 1603 that can reside at any level

18   within an arbitrary configuration structure. An INSTRUCTION file 1603 contains

19   operational directives to be applied to retailer terminals at or below the level of placement

20   in the directory structure (i.e. transaction pricing, unit transmission schedule, revised

21   configuration parameters).

22   Figure 17 illustrates an exemplary end of batch monitor (EBM) display screen

23   1700, in one embodiment of the invention. When the current system batch is closed out,

1   this display 1700 shows the status of the various data processing phases (e.g. system

2   batch 1701) that take place when the collection of received transaction data batches from

3   the retail data communication network interface units are consolidated and sorted by

4   biller for electronic transmission. EBM may be a Visual Basic program that orchestrates

5   the series of Structured Query Language (SQL) scripts and ancillary programs to perform

6   transaction consolidation, general system batch reporting, database trimming and data

7   archiving.

8   Figure 18 illustrates an exemplary electronic transmission interface (ETI) display

9   screen 1800, in one embodiment of the invention. This display 1800 includes a summary

10   1801 of the dollar amounts sent to each of the electronically connected remittance

11   partners. The batch status window 1802 shows the current status of the transmission

12   batches (QUEUED, ACTIVE, DELETED, or COMPLETED). An additional column

13   (not shown) may be included to show the confirmed time of transmission completion.

14   Figure 19 illustrates an exemplary ETI transaction detail display screen 1900, in

15   one embodiment of the invention. For a specific partner (in the example shown,

16   MasterCard RPS), this display shows the details for each remitted transaction – biller

17   name 1901, originating source transaction detail for direct traceability 1902, customer

18   account number 1903 and amount paid 1904. From an electronic perspective, the biller is

19   only interested in the payment amounts to be applied to various customer account

20   numbers.

21   Figure 20 illustrates an exemplary ETI map biller-to-partner display screen 2000,

22   in one embodiment of the invention. For each biller defined in the system, there is a one-

23   to-one mapping of electronic destinations. While ninety-five percent or more billers may

1   have their remittances delivered via the Federal Reserve ACH network, the remainder of

2   the remittances may be delivered by a combination of directly connected links and

3   secondary consolidator links. Display screen 2000 shows, for each biller, a Biller ID

4   2001 and Biller Name 2002 mapped to a particular electronic destination 2003. Not

5   explicitly demonstrated by this display is the implicit dynamic mapping of internal Biller

6   IDs 2001 to external Merchant IDs (depending on the electronic link utilized) that has to

7   take place for this system to interoperate successfully with a variety of external electronic

8   networks. Different electronic links may also have different data formats, as those skilled

9   in the art will appreciate.

10   Figure 21 illustrates an exemplary transaction browser display screen 2100, in one

11   embodiment of the invention. For every transaction processed through the collection

12   system, the transaction browser program accesses and displays all the relevant

13   information pertaining to that transaction, either locally or through a secure Web Server

14   Application access to remote billers. Such information may include, e.g., a selection

15   entry portion 2101, check and trail record 2102, and payment record 2103. (It should be

16   noted that the bill image would typically not be transmitted to the transaction collection

17   system, and that it is shown in this figure for illustrative purposes only.) The system

18   derives the biller account number from the proposed standard format of biller imprinted

19   bar codes, as described herein.

20   In summary, the primary function of the central site transaction collection system

21   1400 is to collect transaction data from the retail network, sort and aggregate the data by

22   biller, and to remit the customer payment data and the money to the biller by the Federal

23   Reserve ACH Network. In the same way that customer data is collected, processed and

1 credited to individual billers, the ACH Network is used to electronically debit the

2 retailers for the payments that they have collected from their customers. The transaction

3 fee, paid by the customer, may be shared by the retailer and the transaction processor.

4 <u>Central Biller Registry System</u>

5   The current state of the bill payment industry is very fragmented, and many billers

6 currently print their own customer invoices to suit the needs of their own remittance

7 processing systems. There is no universal invoice printing standard to which everyone

8 adheres because there is no economic motivation to do so. Several primary items are

9 required for a bar coded customer bill payment system to succeed: (1) an industry

10 standard that is relatively simple to implement with little or no marginal cost; and (2) a

11 sufficiently large network of retail establishments, induced by the economic incentives of

12 taking bill payments with little or no marginal cost; and (3) a method of delivering totally

13 error-free, electronically remitted customer payment data and funds to billers at no

14 charge.

15   From a business point of view, there are several organizations that, once

16 persuaded, might provide the required motivation momentum in each of these areas.

17 With this assumption in hand, a central registry system would be required to collect

18 information and to assign the bar code biller identification numbers, in the same manner

19 that Network Solutions assigns domestic Internet addresses for the World Wide Web or

20 the Uniform Code Council assigns UPC codes for the retail industry.

21   In one embodiment, assigned biller bar code identification numbers may be 7

22 digits in length. The first 6 digits identify the biller (in a maximum population of 1

23 million) with the 7th digit being the check digit. For every biller bar code identification

1   assigned, the following information might be required for central collection: (1) Biller

2   Name, Address, Phone Number, Fax Number; (2) Biller Administrative Contact Name,

3   Phone Number, E-Mail Address; (3) Biller Remittance Contact Name, Phone Number,

4   E-Mail Address; (4); Electronic Connection Type (ACH or Direct); (5) Bank Name,

5   Address, Remit Account Information, Type; (6) Bank Contact Name, Phone Number, E-

6   Mail Address; (7) Account Number Information – detailed account format specifications.

7   Having collected the foregoing information, a biller bar code identification number

8   would be assigned and a set of bar code print specifications sent to the biller contact. It

9   would then be the responsibility of the biller to print and to remit a set of test bill

10   remittance stubs for conformance testing and validation. Conformance testing on the set

11   of sample bill remittance stubs would ensure that the bar code image quality and

12   physical bar code dimensions satisfied the lowest common denominator bar code

13   scanners at retail. Validation testing would ensure that information, supplied by the

14   biller, regarding the printed bar coded customer account number conformed to published

15   account number validation specifications.

16   Payment Time Stamp via Federal Reserve ACH Network

17   The INDIVIDUAL NAME field (Field 7) in the ACH CIE Batch Detail Record

18   contains the customer payment transaction number, which is composed of the following 4

19   data fields: DCNI unit identification (7 digits), last digit of year (1 digit), Julian Date (3

20   digits), and the transaction sequence number (4 digits). While the DCNI unit number

21   identifies the retailer where the customer payment was taken, the next four digits specify

22   the year and the Julian date of payment submission and completion. The

23   DISCRETIONARY DATA (Field 9) in the ACH CIE Batch Detail Record may be

1 populated with the Payment Complete Time encoded as a two digit time field ranging

2 from 00 to 95. As stated above, this number may be divided by 4 to calculate military

3 hours (decimal) to the nearest quarter hour. For example, the number 26 divided by 4

4 would yield 6.5 (0630 or 6:30 AM). Time synchronization may be acquired from

5 universal time standards available through the Internet or national dial-up time services

6 (U.S. Naval Observatory, Washington, DC or the National Institute of Standards and

7 Technology, Boulder, CO).

8   Whether or not sanctioned by a governmental agency, such as the U.S. Post

9 Office, this time stamp could be recognized in much the same way that the U.S. Post

10 Office postmark on letters is used to prove on-time submission. The customer would

11 have printed proof of payment date and time, by virtue of his store receipt, that a biller

12 could not artificially manipulate for purposes of assessing penalty payments. The biller

13 would also have electronic access to this field as well. Currently, the biller has no

14 automated means by which to read the U.S. Post Office postmark for proof of on-time

15 bill payment submission (nor is there any incentive to do so). Bill payment "due date" as

16 specified in the small print of every credit contract can have a variety of individual

17 definitions, none of which is directly visible to or traceable later by the customer. A

18 universal bill payment time stamp would eliminate all the variability of these "due date"

19 definitions if the biller recognized this time stamp as the creditor date of receipt as

20 specified in the Federal Reserve Regulation Z Section 226.10.

21   The advantage of this date stamping mechanism to the customer is that it would

22 give him marginally more time to remit his bill payment on time to the biller. In the

23 extreme, the customer could pay his bill payment at a late-hours store at one minute to

1　midnight on the due date. The customer would no longer have to worry about remittance

2　delivery times. The advantage of this date stamping mechanism to the biller is that

3　extremely late payments may be electronically credited to the biller no later than 36 hours

4　after customer payment. In the majority of cases in which the biller had multiple daily

5　data feeds from his bank, the credit would probably issue in fewer than 24 hours.

6　Electronically delivered and electronically applied, the current level of biller effort in the

7　handling of late payments would be entirely eliminated with this system in place. In the

8　extreme case, billers could safely invoke 48-hour cut-off notices with little or no error of

9　service call recalls.

10　Electronically remitting data and money through the Federal Reserve ACH

11　Network only works for those billers whose customer account numbers are less than or

12　equal to 22 digits which is the current maximum width of Field 8, INDIVIDUAL

13　IDENTIFICATION NUMBER, using the standard CIE Entry Detail Record format. If a

14　remitted customer account number is longer than 22 characters, then either one of two

15　possible solutions is available: using Field 3, 80 columns of data in the CIE Addenda

16　Record format; or implementing a dedicated data link to the biller with a biller specific

17　data format.

18　　　　Alternative Electronic Networks to Accommodate Special Billers

19　For high volume billers preferring to have their data delivered to them faster than

20　the current Federal Reserve ACH Network delivery schedule, direct file transfer links

21　(e.g. FTP) from the ETI machine through the Internet may be made available. File data

22　formats and the particular delivery mechanisms may be tailored to meet any biller

23　requirement, so long as it expedites the flow of customer payment information. In this

1   mode of operation, biller data would be available for processing within minutes after the

2   scheduled transaction collection system production "system roll" completes. The

3   "system roll" sorts and aggregates biller data on a daily production schedule – once every

4   12 hours. Payment totals for these transaction batches would be delivered via the ACH

5   Network. For a trusted remitter, it is not necessary to directly couple the transaction

6   dollars with the transaction data. The time lag between transaction data and transaction

7   dollars via the Federal Reserve ACH Network should be no more than 24 hours.

8   Improved Payment Embodiments

9   The embodiments described hereinabove relate, generally, to bar code based

10   biller/payor systems for electronic bill payment. As described hereinabove, it is

11   contemplated that, in an exemplary electronic bill payment infrastructure (e.g., see

12   reference numeral 500 of Figure 5) consistent with the invention, consumers can pay their

13   bills at supermarkets and large retail chain stores and receive immediate credit from

14   billers for their payments. In such an infrastructure, the biller receives good payment

15   funds, deposited directly into his bank account, and error-free electronic payment data for

16   consumer bill payments by 6 AM the very next business day. Contractually, the biller

17   backdates the received bill payments to the "electronic postmark" time and date paid at

18   retail, regardless of the time that the payment data takes to post to the biller's accounts

19   receivable system. Compared to the present paper based remittance processes commonly

20   employed throughout the payments industry today, such an infrastructure provides for an

21   electronic process that remits error-free payment funds and data directly to billers within

22   hours, rather than days.

1   As efficient as this electronic bill payment process may be, it may not be fast

2   enough for the needs of Internet commerce based companies, selling products to

3   electronically connected remote consumers. The electronic bill payment process, as

4   described hereinabove with respect to billers and payors, still depends on the biller

5   generating a paper bar coded invoice statement and sending it to the consumer by US

6   Mail, a process that can take, on average, anywhere between 6-8 days. When the

7   consumer has the financial resources in hand to pay his bill, he can then remit his

8   payment directly to the biller, electronically, within hours.

9   In an improvement to the electronic infrastructure for this process, described in

10   this section, Internet commerce-based companies can now choose a new bill payment

11   method that is very simple and can reduce the time interval between biller invoice

12   statement generation and consumer payment notification to the biller, to less an hour.

13   Another improvement to the electronic infrastructure for this process, described in

14   this section, is the provision for person-to-person money transfers. Currently, there are

15   several organizations that offer electronic person-to-person money transfers as long as the

16   sending and receiving parties deposit and receive their remitted funds within the same

17   organizational network of geographically dispersed branch offices. What may be a

18   convenient remittance location for the sender may not be so for the receiver and/or vice-

19   versa. Person-to-person money transfers can be easily accomplished with a bar coded

20   deposit slip that permits a sender to remit funds directly into a receiver's bank account,

21   and such funds are subsequently accessible for withdrawal at a nearby and convenient

22   Automated Teller Machine (ATM) or for a debit card purchase. The details of these

23   improvements are discussed hereinbelow:

1   <u>Improved Electronic Bill Payment Network</u>

2   The embodiments described in this section relate to an improved national

3   electronic bill payment network, wherein bar coded invoice statements are generated

4   immediately by the biller or the consumer and remitted to the consumer in the span of

5   seconds to minutes via facsimile, e-mail or other image transmission method. Upon

6   receipt of such an imaged invoice statement, the consumer, with payment in hand, may

7   go to a local store that accepts and processes these bill payments. When the consumer

8   payment is processed at retail, it is electronically remitted to the biller with absolute

9   accuracy within 24 hours after receipt of payment, and electronic notification to the biller

10   may occur within minutes after receipt of payment, with no payment repudiation.

11   Such an electronic bill payment network offers the following benefits: The biller

12   benefits by receiving 100 percent accurate electronic bill payment information and good

13   funds, delivered into his bank account by 6 AM the very next business day that can be

14   directly applied to his accounts receivable. The biller benefits by receiving an immediate

15   electronic notification of consumer payment at retail with funds that cannot later be

16   retracted. As a result, billers can then ship the consumer product sooner, thereby raising

17   consumer satisfaction levels with their Internet portal. The consumer benefits by

18   receiving an immediate electronically delivered bar coded invoice statement for his

19   Internet shopping basket of products via facsimile, e-mail or other image transmission

20   method. The consumer benefits because he can then pay his bar coded invoice statement

21   locally with his choice of cash, check, debit card or any credit card for his Internet

22   shopping basket without having to disclose any personal financial information to a

23   remote Internet store. Further, local payment precludes the possibility of future fraud

1 resulting from hackers' or others' unlawful access to any stored financial information left

2 and residing at remote Internet stores. The local retail establishment benefits by

3 receiving a relatively cost-free margin from each payment transaction taken. Finally, it is

4 anticipated that a national enhanced network with many retail outlets will spur the

5 demand for yet new immediate and electronically delivered financial products and

6 services, using "signature" specific bar codes, and thus, may generally benefit the

7 economy of the country or other geographic area in which it is implemented.

8 An exemplary embodiment of the improved bar coded bill payment based system

9 consistent with the present invention utilizes a bar code on the biller invoice, which is

10 delivered to the customer electronically, i.e., by fax, e-mail, or, other image transmission

11 method, and payment information and payment credits are returned to the biller

12 electronically. This system may augment some elements of the biller/payor network 500

13 (described hereinabove with respect to Figure 5) with faster and parallel processing

14 elements. In this case, the biller accounts receivable and US Mail consumer remittance

15 mechanisms may be enhanced with a new accounts receivable invoice statement image

16 generation mechanism that can be activated, on demand, either by a biller customer

17 service representative or by a consumer initiated action. The result of either action is a

18 bar coded invoice statement image that is electronically remitted to the consumer within a

19 time frame of seconds to minutes. The transaction collection system described

20 hereinabove, which already has an inherent user Internet accessible transaction browser

21 capability, may be enhanced with e-mail, facsimile or other means of electronic

22 notification to the biller when specifically designated payments have been received. An

1   automated caller response system may provide for consumer inquiry confirmation of

2   payments.

3   Turning now to Figure 22, an exemplary improved electronic bill payment

4   network 2200 is illustrated. For all the goods and services rendered to a consumer over a

5   given traditional billing period (or interactive Internet shopping session), the biller

6   accounts receivable 2202 may accumulate a dollar total and generate a detailed bar coded

7   invoice statement image 2203 that can be electronically remitted to the consumer 2204.

8   This same process can also be used by a biller customer service representative 2201 to

9   replicate a previous invoice statement that a consumer may have lost. For example, if a

10 consumer wants an immediate replacement copy of the invoice for payment, the

11 consumer can access a biller web site to generate a remittance or deposit document. The

12 time for a consumer to request the electronic invoice statement 2203 may be as little as a

13 few minutes after a request is made. The invoice 2203 is transmitted to the consumer

14 2204, which transmission may be from a few seconds to several minutes, depending on

15 factors such as the method of transmission, queue capacity, and number of open queue

16 slots. The consumer 2204 receives the bar coded invoice statement image 2203.

17   To pay the bill, the consumer 2203 might go to a local store (or other location

18 with appropriate hardware/software/network connection) that processes these bill

19 payments. The time for this to occur is variable, depending upon the consumer's

20 circumstances, and may occur in as little as a few minutes. The consumer 2203 presents

21 his imaged bar coded invoice statement 2203 to the checkout cashier for scanning by the

22 checkout scanner 2205, which may be done while other retail UPC coded items are being

23 scanned. Instead of looking up an in-house UPC code for pricing, the scanner 2205

1   would pick up the bill payment bar code that identifies the biller to be paid and the

2   account number to be credited. The consumer tells the checkout cashier the amount to be

3   paid on that account and his option for requesting "normal" or "express" payment

4   processing, and the cashier inputs the amount to be paid into a terminal (which may be

5   integrated into a point-of-sale system) which is in communication with a backend host

6   processing system 2206. The checkout of remaining products and items (or bills)

7   continues until the complete total for all goods and services is calculated. Upon receiving

8   payment from the consumer, that bill payment is then complete. The consumer may

9   receive a printed receipt of the payment tendered with the date and time the payment was

10   made. The in-store backend host processing system 2206 immediately completes and

11   forwards all the payment data to the data collection network interface unit 2207, which

12   may occur in a little as a few seconds.

13   The data collection network interface 2207 (DCNI) unit collects and stores all the

14   consumer bill payment data in non-volatile memory. Periodically (e.g., throughout the

15   day, and/or based on time and transaction volume thresholds), the DCNI 2207 transmits

16   the bill payment data to the central site transaction collection system 2211, which is part

17   of a central site computer system 2210 that may also include an Internet server/browser

18   2212 and/or automatic caller response system 2213. Additional transmissions may be

19   scheduled before the daily transaction collection system 2211 aggregation times. If a

20   particular consumer payment is designated for "express" processing, it may immediately

21   be transmitted to the central site computer system 2210 when the transaction void

22   window expires for that payment. The time for the back-end and collection system

23   processing has no impact on customer payment time, since all payments may be time-

1   stamped. Separately calculated calendar day payment counts and totals may also be sent

2   to the transaction collection system 2211 as an independent transaction audit balancing

3   mechanism.

4   The transaction collection system 2211 may continuously (and/or periodically)

5   receive payment data information from a distributed network comprising a plurality of

6   data collection network interface units 2207 deployed at field retail establishments.

7   Before the last processing window closes at the Federal Reserve Automated Clearing

8   House (ACH) Network 2214, all customer payments may be sorted and aggregated for

9   direct remission to their respective billers, which may take approximately an hour.

10   As the transaction collection system 2211 receives payment data information from

11   the network of data collection network interface units 2207, it processes and stores each

12   consumer bill payment into a database. Once stored in the database, that payment and

13   ancillary information can be viewed with a local transaction browser or Internet web site

14   display 2212. When "express" payments are encountered in the payment data stream,

15   immediate electronic notification may be posted to the biller in one of several possible

16   forms: e-mail, facsimile or biller specified custom electronic form. Accessible from that

17   same database information, an automated caller response system 2213 can verbally

18   confirm the receipt of a particular transaction, particularly for customers 2209 seeking

19   "comfort call" confirmation regarding the status of a payment. For "normal" payments,

20   the biller customer service toll-free number may be nominally printed on the consumer

21   receipt. For "express" payments, the biller customer service toll-free number may be

22   replaced with a special in-house toll-free number to relieve biller customer service

1 representatives 2208 of nervous consumer confirmation inquiry calls, typically for

2 payments that are long overdue.

3   Processing and distribution of electronic payment data may be done using the

4 Federal Reserve Automated Clearing House (ACH) Network 2214, which may take 6-9

5 hours. At the biller's bank 2215, the electronic payment data may be received from the

6 ACH Network 2214 and stripped and reformatted according to biller specified formats,

7 which may take 4-6 hours. Finally, the biller's accounts receivable 2202 and/or customer

8 service computer files may be updated. Depending on the "legacy factor" of the biller's

9 computer processing systems, this process can range anywhere from 2-3 hours to 4-5

10 days.

11   From both the biller's and consumer's perspective, the payment network/system

12 2200 described in this section may be contrasted with the biller-payor network/system

13 500 (described hereinabove with reference to Figures 5 et seq.), as follows:

14   From the biller perspective, both networks 500, 2200 may be capable of

15 delivering good payment funds and data directly into the biller's bank account by 6 AM

16 the next business day after the consumer pays his bill at retail. The improved network

17 2200 may deliver electronic notification of consumer payment information to the biller

18 within minutes after the payment is made at retail with the "express" delivery service.

19 All payment funds collected can remain safe and secure within the Federal Reserve

20 banking system network at all times. Moreover, the improved network 2200 can deliver

21 a consumer invoice electronically and immediately, assuming the biller can generate and

22 remit an electronic invoice statement image 2203 and the consumer has a corresponding

23 device or means with which to receive the electronic biller invoice statement image (e-

1   mail, facsimile etc.). With this enhanced network 2200, the biller, having Internet access

2   and using his choice of standard Internet browsers, can confirm a consumer's payment by

3   querying the database of processed transactions in the transaction collection system 2211

4   with a variety of database selection keys and criteria. Further, the biller can receive full

5   payment funds for the amount stated on the bar coded invoice statement 2203. This point

6   is especially important when it comes to paying various governmental and state license,

7   permit and tax fees. By statute, many states and governmental organizations cannot

8   accept the payment of license, permit and tax fees from consumers using either credit or

9   debit cards because of the subsequent discounted payments remitted. Third-party

10 payment surcharges, directly assessed from the consumer over and above the due

11 payment amount, are generally acceptable. For example, the Commonwealth of

12 Massachusetts has 307 different types of license, permit and tax fees that must be paid by

13 consumers either by check or cash.

14   From the consumer perspective, the consumer can have a choice of local payment

15 method (e.g., cash, check, debit card or any credit card), when paying a bar coded invoice

16 statement 2203 at retail. The consumer does not have to divulge any personal financial

17 information to a remote Internet storefront that electronically generates and delivers bar

18 coded invoice statements directly to a consumer. With this enhanced network 2200, the

19 consumer can subsequently confirm the electronic receipt of his processed payment at

20 retail from an automatic caller response system 2213. Further, with this enhanced

21 network 2200, the consumer, having Internet access and using his choice of standard

22 Internet browsers, can confirm his own payment by querying the database of processed

1 transactions in the transaction collection system 2211 with a specific transaction

2 identification number.

3 Presently for Internet commerce based companies, there is no mechanism

4 available for conducting a purely "cash" sale over the Internet, where consumer cash and

5 retail product can be exchanged in one anonymous atomic transaction. Currently,

6 problems abound with all other forms of present payment methods, as follows:

7 Payment method fees always erode the profit margin of any retail or Internet

8 storefront. Credit and debit card companies charge retail merchants varying

9 commissions, based on a variety of factors that can range upwards from 2% of the

10 purchase price. By law, these merchants cannot charge consumers different prices for the

11 same retail product whether paid for with cash or by credit. Check guarantee companies

12 impose processing charges on every consumer check passed through their service. Third

13 party "e-wallet" payment type companies also charge for their value-added services as

14 well. Therefore, the merchant absorbs these various discounts from his profit margin as a

15 normal "cost of doing business". Checks, if exchanged, take time to clear and can be

16 "stop paid" at the whim of the consumer. No one is exposed in this situation if the seller

17 chooses to wait out the prescribed check clearing time (on average, approximately 4-5

18 days); however, ultimate consumer satisfaction will be impacted by this delay. Credit

19 card transactions require the consumer to divulge personal financial information to the

20 remote Internet seller, which leaves open the potential for future and untraceable fraud.

21 Then, that credit card transaction can be disputed and repudiated by the consumer, up to

22 60 days later, leaving the seller with an uncollectable debt. While debit card transactions

23 cannot be repudiated, they also require the consumer to divulge personal financial

1   information to the remote Internet seller, again, leaving open the potential for future and

2   untraceable fraud. The consumer generally has no guaranteed recourse to recover any

3   stolen funds debited from his account. Third party "e-wallet" payment type companies

4   that require consumers to register their bank account numbers for secured transaction

5   payments over the Internet are ripe for large-scale fraud. The consumer generally has no

6   guaranteed recourse to recover any stolen funds debited from his E-Wallet.

7   The enhanced electronic bill payment network 2200 consistent with the present

8   invention permits remote buyers and sellers to perform anonymous "cash" sale

9   transactions, using the Federal Reserve banking system as the trusted escrow agent to

10   safely and securely transfer funds between buyers and sellers.

11   An advantageous feature of this enhanced bill payment network, with a

12   standardized bar coded bill payment "signature" featured as its centerpiece remittance

13   mechanism, is that all the non-deterministic time delays have been removed from the

14   total bill payment cycle. In legacy bill pay arrangements, the two largest delay factors

15   are the biller invoice paper statement preparation, printing, mailing systems and the US

16   Post Office mail delivery system. With the present invention, the consumer can now

17   exercise a larger control function over his bill payment remittance process.   The

18   consumer can request an immediate invoice statement, which only requires minutes to

19   formulate and to deliver electronically. The consumer has his choice of payment

20   methods at a trusted local retail establishment and receives a printed bill payment receipt

21   confirmation, guaranteed by the biller. The consumer payment method to the biller is

22   completely anonymous, in terms of divulged personal financial information.

23   Subsequently, the consumer, as well as the biller, can verify that the bill payment has

1   been received and processed at the central payment distribution site. Thereafter, payment

2   funds and information may be electronically remitted to the biller within hours, by 6 AM

3   the following business day directly into the biller's bank account.

4   It should be recognized by those skilled in the art that, although the foregoing

5   description refers to a bar code transmitted by e-mail or by facsimile, other methods of

6   transmission are possible and are included in the invention, e.g., facsimile transmission to

7   or from a computer, facsimile machine, e-mail, file transfer protocol (FTP), hypertext

8   markup language (HTML), extended markup language (XML), hypertext transport

9   protocol (HTTP), modem, the Internet, a wide-area network (WAN), a local-area network

10   (LAN), diskette, or other removable storage medium.

11   <u>Money Transfer Embodiments</u>

12   In the above descriptions of an exemplary electronic bill payment network 500

13   (described hereinabove with reference to Figures 5 et seq.), references have been made

14   regarding the extensibility of this network and its internal structure to provide for new,

15   cost-effective financial products and services. Domestic and international person-to-

16   person money transfer services is one such product described here. (Of course, the

17   money transfer technology described in this section may also have applicability to

18   business-to-person, person-to-business, business-to-business, or other types of money

19   transfers.)

20   The current forms of domestic and international money transfer services offered

21   today are very labor intensive for both the person sending the money as well as the

22   service provider. The amount of paperwork that has to be filled out by the sender and

23   then manually transcribed into a "communication system" by the service provider has

1   been the ostensible justification to the customer of the high fee structure to provide this

2   service. In point of fact, this service is extremely profitable, which is aptly demonstrated

3   by the fact that there are so many large and small money transfer service providers in this

4   industry, primarily serving immigrant communities whose members regularly send

5   money to their home country families. Some service providers, such as Western Union,

6   use relatively "high tech" electronic communication services to transfer funds while other

7   small service providers use "low tech" courier services to physically transport funds to

8   their intended destination.

9   Currently, there are several organizations that sell domestic or international

10 electronic person-to-person money transfers as long as the sending and receiving parties

11 deposit and pick up the remitted funds within the same organizational network of

12 geographically dispersed branch offices. Fees for this service can range upwards from

13 $35 per transfer. However, convenient remittance locations for the local sender may not

14 have corresponding convenient delivery locations for the remote receiver, or vice-versa.

15   In a system consistent with the present invention, domestic person-to-person

16 money transfers can be easily accomplished with a bar coded deposit slip that permits a

17 remote sender to remit funds directly into a receiver's bank checking account, providing

18 funds that are subsequently accessible at a convenient local automated teller machine

19 (ATM) or for a debit card purchase.

20   Future international (e.g., Mexican) person-to-person money transfers can be

21 coordinated with appropriate financial organizations or banks that commonly distribute a

22 form of debit card to their customer base. These organizations would distribute to their

23 customer base plastic bar coded deposit-only cards keyed directly to their debit card,

1   which may then be sent to a remitter in another country (e.g., the United States). Using

2   that bar coded plastic deposit-only card instead of a bar coded bank deposit slip would

3   effect a deposit of the funds directly into the debit card account corresponding to the

4   deposit-only card. In this way, domestic and international money transfers could cost far

5   less than the fees charged today for this equivalent service.

6   The complete details of a bar coded bill payment "signature" are described

7   hereinabove in the section entitled "Bar Coding Validation" with respect to Figures 10

8   and 11, wherein a structure of successive data envelopes of embedded "signature" data

9   fields are employed, consisting of a series of format designators, data and check digits.

10   In the examples of Figures 10 and 11, which illustrate two arbitrary format designator

11   values, the customer account number consisted of one numeric field whose associated

12   check digit was the trailing digit of either a divulged format (= 3) or an unknown format

13   (= 4) to which the biller appended a check digit according to a specified algorithm. In

14   both cases, there is an independent mechanism in place to mathematically check the

15   validity of the customer account number.

16   In the person-to-person electronic money transfer embodiment described in this

17   section, the retail based electronic bill payment infrastructure is utilized, with the

18   modification that the biller identification number is now used to identify the destination

19   payment network instead of a destination biller organization. In the U.S. banking system,

20   the standard bank account numbering scheme is based on a two-part number system

21   consisting of an ABA (American Banking Association) number (8 digits plus a check

22   digit), uniquely identifying the U.S. bank institution, and a local account numbering

23   convention within that banking institution. While the format designator = 4 validation

1   template scheme can reliably be used to implement a generalized person-to-bank account

2   remittance mechanism within the structure of the electronic bill payments infrastructure,

3   the definition of a new format designator validation template would offer several

4   advantages: An additional customer account number validation step further reduces data

5   errors. Within the full customer specified account number, the ABA portion of the

6   account number can be independently verified. The biller identification number would

7   be reduced from 6 to 2 digits, in recognition of the fact that there are many fewer bank

8   based or money transfer payment networks than billers. With a reduced number string,

9   shorter bar code strings fit more appropriately on small banking deposit slips that

10 measure, on average, 6" wide by 3" high.

11   Figure 23 illustrates an exemplary specification for the new format designator = 5

12 format. As shown, the bar code 2300 comprises a 1-digit format designator value = 5; the

13 number of components (2 fixed length (3,9), 1 variable length) by definition; 2-digit

14 payment network identification number; 1 check digit of preceding 2 digits using 37

15 weights, MOD10 algorithm; 8-digit ABA number (51066065); 1 check digit of preceding

16 8 digits using 37137137 weights, MOD10 algorithm; entire customer bank account

17 number (5106606550766936692) using 1212... weights, split MOD10 with added check

18 digit to be discarded before presentment to the destination payment network (4); and

19 calculated check digit of level 3 envelope using 2121... weights, split MOD10 algorithm

20 (4).

21   As illustrated in Figure 24, this bar code 2401 appearing on a bank deposit slip

22 2400 (or, alternatively, printed on a plastic or paper card, or printed on other media, e.g.,

23 debit card, credit card, bank card, affinity card, card bearing a magnetic stripe,

1   identification card, smart card, or card bearing at least one name corresponding to an

2   account number encoded in said bar code) could be presented at a retail checkout aisle,

3   equipped for bill payment transactions, to initiate domestic person-to-person money

4   transfers. By 6 AM the following business day, the money remitted the previous day

5   may be available to the recipient to withdraw from a local ATM machine or to make

6   payment from a debit card keyed or associated with that account. The ATM or debit card

7   PIN (personal identification number) provides the same level of access security to the

8   receiver of these person-to-person money transfers as exists for local funds that already

9   reside in the account.

10   To implement an international (i.e., any-person-to-any-person electronic money

11   transfer) using the retail based electronic bill payment infrastructure, the biller

12   identification number may be used to uniquely identify the target destination payment

13   network. In the case of a foreign payment network based on a system of debit card

14   accounts, the format designator = 4 validation template scheme can reliably be used to

15   implement and validate any generalized account numbering scheme to remit funds. A

16   new format designator validation template definition offers extended customer account

17   number verification advantages only if the destination payment network is willing to

18   divulge its mathematical or other method of customer account numbering validation

19   scheme.

20   In a hypothetical exemplary scenario consistent with the invention, a national

21   chain of retail gas stations/convenience supermarket stores called GasoMax is located

22   throughout the whole of Mexico, serving the public at large. GasoMax issues PIN

23   protected debit cards to all their customers, in effect, setting up a pseudo-bank account

1   for each of them. Instead of carrying cash, these customers deposit or apply money to

2   these accounts so that they can later purchase food staples or convenience items at the

3   same time they come for fuel. When GasoMax issues these PIN-protected debit cards to

4   their customer base, one or more bar coded deposit only cards are included (and/or a bar

5   code might be printed on the debit card itself). The debit card can either be used to

6   deposit local money into their account or to withdraw money in the form of purchases at

7   the national chain GasoMax gas stations. Figure 25 illustrates an exemplary GasoMax

8   debit card 2500, which resembles a standard debit card. Figure 26 illustrates an

9   exemplary deposit-only card 2600 comprising a bar code 2601 consistent with the

10   invention. In this exemplary scenario, the bar coded deposit-only card 2600 (or,

11   alternatively, a bar code printed on the standard debit card) would be used in U.S. retail

12   stores that offer access to the electronic bill payment network. Whereas most customers

13   submit their U.S. based biller bar coded invoice statements to the cashier for payment, the

14   customer that presents the GasoMax bar coded deposit-only card 2600 is making a

15   payment to a destination payment network (Payment Network = 51, using a standard

16   Format Designator = 4 description). Payments remitted to this payment network are

17   automatically converted to local currency by GasoMax at a better rate than the larger

18   commercial money transfer organizations. Commercial money transfer companies

19   charge up to $25 per $300 remittance as a foreign exchange (FX) fee on top of the base

20     $35 remittance fee. In the recent past, wire transfer companies have been sanctioned for

21   these usurious currency exchange practices. GasoMax would have a greater incentive to

22   offer a better exchange rate to its customer base for its money transfer services than the

23   current crop of commercial money transfer services. GasoMax could expand its local

1   customer base to shop for goods and services through its chain of gas station

2   supermarkets that also offers a convenient money transfer service, as an affinity draw or

3   loyalty program, for relatives working outside of the country to support their loved ones

4   in Mexico.

5   Several further examples of "real-life" scenarios demonstrating the utility of an

6   improved payment network consistent with the invention are provided, as follows:

7   Example 1: Payment for Mobile Telephone Service

8   A client procures a mobile phone subscription from a well-known national

9   vendor. The client gives his place of employment as his cell phone billing address. As a

10   new customer, he is assigned a total credit limit and an accrued monthly limit. When this

11   client subsequently leaves his place of employment, he forgets about changing his mobile

12   phone billing address and continues to use his mobile phone regularly, until one day his

13   mobile phone stops working. When he calls the customer service office to inquire about

14   the matter, he finds out that his mobile phone usage is well within his credit limits but

15   that the reason for his mobile phone being disconnected is that bill payment is overdue by

16   ten days. The company does not accept credit card payments and only accepts a check

17   payment for the total past due amount. The company restores his service ten days after

18   receiving and processing his check.

19   With an enhanced bill payment network consistent with the invention in place,

20   this client could have remitted his late payment with the "express" payment service, as

21   described hereinabove. The mobile phone company would have been electronically

22   notified minutes after his retail payment, so that his cell phone service could be restored

23   within an hour, rather than days.

1 <u>Example 2: Payment for Internet-Based Auction</u>

2   The business model for the Internet-based auction (e.g., eBay) is very basic in

3 concept, a meeting place for bringing together Internet buyers and sellers, wherein an

4 electronic framework displays sellers' goods and services. When a sale is completed

5 between a seller and a buyer, the online auction house charges a sales commission. It is

6 the responsibility of the seller and the buyer to establish a lowest common denominator

7 payment exchange method. Individuals selling items, are generally not equipped to

8 process Mastercard or VISA credit or debit cards. If the seller accepts a personal check

9 payment from the buyer, shipment of the sold item is delayed until the buyer check

10 clears. A buyer can mitigate a seller shipment delay if he is willing to go out and

11 purchase a money order to send to the seller. If the buyer and seller wish to use a third-

12 party payment clearinghouse, (e.g., Billpoint or PayPal), then both must register personal

13 financial information about their respective bank accounts to transfer money, as well as

14 pay yet another sales commission charge. In general, none of these payment alternatives

15 are particularly attractive if a buyer or seller desires any degree of financial

16 confidentiality.

17   With an electronic payment network consistent with the invention in place, an

18 online auction house could provide a cost-effective and value-added anonymous payment

19 alternative within its framework of auction services. When a sale is completed, the

20 online auction house provides the means for the buyer to print out a bar coded invoice

21 statement, citing the online auction house as the biller of record with a transaction

22 identification number. Instead of purchasing a money order, which would then have to

23 be physically remitted, the buyer then pays this invoice at a local supermarket. When the

1   online auction house receives the electronic payment the very next business day, it

2   notifies the seller of the completed payment via e-mail and then sends a check for that

3   payment amount to the seller. Aside from exchanging their mailing addresses, both

4   buyer and seller maintain their financial privacy.

5   This same sales paradigm would also work well for home shopping television

6   channel environments, (e.g., Home Shopping Network, QVC), wherein the "express"

7   payment option could be used when buyer desire is at its highest level.

8   <u>Example 3: Automobile Insurance Payment</u>

9   Insurance companies have varying grace periods within which to pay their

10   insurance premiums, beyond which the policy is irrevocably canceled. If one cannot or

11   chooses not to pay the entire annual premium on its anniversary date, an installment plan

12   of smaller payments may alternatively be offered. If a premium payment is not received,

13   a cancellation notice is sent toward the end of the payment grace period specifying a

14   "hard" cancellation date. If a policy is canceled due to non-payment, depending on the

15   prior payment history, the insurance carrier may not want to reissue another insurance

16   policy because of a previous poor payment record. Therefore, given the gravity of the

17   possible consequences, time is of the essence when it comes to paying insurance

18   premiums on time – whether for car insurance, home insurance or personal life insurance.

19   Mailed late payments may not be delivered and processed in time. Depending on

20   company policy, even in-person payments directly to insurance agents, during normal

21   business hours, may or may not be acceptable. A confirmed electronic payment made

22   using an enhanced bill payment network consistent with the invention would provide a

1 way for both the insurance company and insureds to know precisely when premiums are

2 paid.

<center>Example 4: Payment to College Student</center>

4 When a parent agrees to send money for college expenses to a child away at

5 school, a question that typically arises is, "how fast do you need the money?" A printed

6 bar coded bill payment "signature" on out-of-town bank checking account deposit slips

7 would enable remote deposits with a simple cash, check, debit card or any credit card

8 payment at a local supermarket. A college-bound child could have previously sent home

9 an ample supply of these deposit slips to cover for such eventualities. If a supply of

10 originals is not available, a facsimile copy (sent at high resolution mode) will generally

11 perform the job equally well. Funds deposited with this payment mechanism are

12 electronically available the very next morning for withdrawal from a local ATM cash-

13 dispensing machine. For a small fee (e.g., about a dollar), this service is much faster,

14 more convenient to all parties involved and cost-effective than any existing person-to-

15 person money transfer service.

<center>Further Alternate Embodiments</center>

17 The present invention may use the public Internet and Internet compatible HTTP

18 and UDP protocols for the network interconnections described herein, as well as the

19 Federal Reserve Automated Clearing House (ACH) Network or other networks. Those

20 skilled in the art will recognize that the servers and their various components, as well as

21 any other components described herein may be implemented in software, hardware, or a

22 combination of both, and may be separate components or be integrated into other

23 components described above. Likewise, the processes described herein may be separate

1   or combined and may run on common, shared, or separate machines, and as integrated or

2   separate software modules.

3   Additionally, scanning bar codes, in methods consistent with the invention, may

4   be performed using, e.g., wand or handheld scanning devices, scanning devices mounted

5   to or near a point of sale system, and other such scanning devices, and such devices may

6   be devices coupled to other devices, e.g., a computer, cash register, or point of sale

7   system, or alternatively, integrated therein. A scanning device consistent with the

8   invention may alternatively be coupled to or integrated into a PDA, handheld or pocket

9   computer, as well as a mobile telephone or other portable, wireless, or computerized

10   device. Thus, it is contemplated that an account corresponding to a mobile telephone or

11   other such device, or other credit or debit account corresponding to the user of such a

12   device, could be automatically debited for payment to a payee, in methods consistent

13   with the invention.

14   It will be appreciated by those skilled in the art that, although the functional

15   components of the above described embodiments of the system of the present invention

16   are embodied as one or more distributed computer program processes, data structures,

17   dictionaries or other stored data on one or more conventional general purpose computers

18   (e.g. IBM-compatible, Apple Macintosh, and/or RISC microprocessor-based computers),

19   mainframes, minicomputers, conventional telecommunications (e.g. modem, DSL,

20   satellite and/or ISDN communications), memory storage means (e.g. RAM, ROM) and

21   storage devices (e.g. computer-readable memory, disk array, direct access storage)

22   networked together by conventional network hardware and software (e.g. LAN/WAN

1   network backbone systems and/or Internet), other types of computers and network

2   resources may be used without departing from the present invention.

3   The invention as described herein may be embodied in one or more computers

4   residing on one or more server systems, and input/output access to the invention may

5   comprise appropriate hardware and software (e.g. personal and/or mainframe computers

6   provisioned with Internet wide area network communications hardware and software (e.g.

7   CQI-based, FTP, Netscape Navigator™ or Microsoft Internet Explorer™ HTML Internet

8   browser software, and/or direct real-time TCP/IP interfaces accessing real-time TCP/IP

9   sockets) for permitting human users to send and receive data, or to allow unattended

10   execution of various operations of the invention, in real-time and/or batch-type

11   transactions and/or at user-selectable intervals. Likewise, it is contemplated that the

12   above-described servers consistent with the present invention may be remote Internet-

13   based servers accessible through conventional communications channels (e.g.

14   conventional telecommunications, broadband communications, wireless

15   communications) using conventional browser software (e.g. Netscape Navigator™ or

16   Microsoft Internet Explorer™), and that the present invention should be appropriately

17   adapted to include such communication functionality. Additionally, those skilled in the

18   art will recognize that the various components of the system of the present invention can

19   be remote from one another, and may further comprise appropriate communications

20   hardware/software and/or LAN/WAN hardware and/or software to accomplish the

21   functionality herein described. Alternatively, a system consistent with the present

22   invention may operate completely within a single machine, e.g. a mainframe computer,

23   and not as part of a network.

1   Moreover, each of the functional components of the present invention may be

2   embodied as one or more distributed computer program processes running on one or

3   more conventional general purpose computers networked together by conventional

4   networking hardware and software. Each of these functional components may be

5   embodied by running distributed computer program processes (e.g., generated using

6   "full-scale" relational database engines such as IBM DB2™, Microsoft SQL Server™,

7   Sybase SQL Server™, or Oracle 8.0™ database managers, and/or a JDBC interface to

8   link to such databases) on networked computer systems (e.g. comprising mainframe

9   and/or symmetrically or massively parallel computing systems such as the IBM SB2™

10   or HP 9000™ computer systems) including appropriate mass storage, networking, and

11   other hardware and software for permitting these functional components to achieve the

12   stated function. These computer systems may be geographically distributed and

13   connected together via appropriate wide- and local-area network hardware and software.

14   Primary elements of the invention may be server-based and may reside on

15   hardware supporting an operating system such as Microsoft Windows NT/2000™ or

16   UNIX. Clients may include computers with windowed or non-windowed operating

17   systems, e.g., a PC that supports Apple Macintosh™, Microsoft Windows

18   95/98/NT/ME/2000™, or MS-DOS™, a UNIX Motif workstation platform, a Palm™,

19   Windows CE™ -based or other handheld computer, a network- or web-enabled mobile

20   telephone or similar device, or any other computer capable of TCP/IP or other network-

21   based interaction. The communications media described herein (generally referred to

22   using the generic term "network") may be a wired or wireless network, or a combination

23   thereof.

1   Alternatively, the aforesaid functional components may be embodied by a

2   plurality of separate computer processes (e.g. generated via dBase™, Xbase™, MS

3   Access™ or other "flat file" type database management systems or products) running on

4   IBM-type, Intel Pentium™ or RISC microprocessor-based personal computers

5   networked together via conventional networking hardware and software and including

6   such other additional conventional hardware and software as is necessary to permit these

7   functional components to achieve the stated functionalities. In this alternative

8   configuration, since such personal computers typically are unable to run full-scale

9   relational database engines of the types presented above, a non-relational flat file "table"

10   may be included in at least one of the networked personal computers to represent at least

11   portions of data stored by a system consistent with the present invention. These personal

12   computers may run, e.g., Unix, Microsoft Windows NT/2000™ or Windows

13   95/98/ME™ operating system. The aforesaid functional components of a system

14   consistent with the present invention may also comprise a combination of the above two

15   configurations (e.g. by computer program processes running on a combination of

16   personal computers, RISC systems, mainframes, symmetric or parallel computer systems,

17   and/or other appropriate hardware and software, networked together via appropriate

18   wide- and local-area network hardware and software).

19   As those in the art will recognize, possible embodiments of the invention may

20   include one- or two-way data encryption and/or digital certification for data being input

21   and output, to provide security to data during transfer. Further embodiments may

22   comprise security means in the including one or more of the following: password or PIN

23   number protection, use of a semiconductor, magnetic or other physical key device,

1 biometric methods (including fingerprint, nailbed, palm, iris, or retina scanning,

2 handwriting analysis, handprint recognition, voice recognition, or facial imaging), or

3 other security measures known in the art. Such security measures may be implemented

4 in one or more processes of the invention.

5 Source code may be written in an object-oriented or non-object-oriented

6 programming language using relational or flat-file databases and may include the use of

7 other programming languages, e.g., C++, Java, HTML, Perl, UNIX shell scripting,

8 assembly language, Fortran, Pascal, Visual Basic, and QuickBasic. It is noted that the

9 screen displays illustrated herein at Figures 15-21 are provided by way of example only,

10 and are not to be construed as limiting the invention or any component thereof to the

11 exemplary embodiments illustrated therein.

12 Furthermore, it is contemplated that the system and method described herein may

13 be implemented as part of a business method, wherein payment is received from users,

14 which might include customers, retailers, and/or billers employing the invention. Such

15 users may pay for the use of the invention based on the number of files, messages, bills,

16 or other units of data sent or received or processed, based on bandwidth used, on a

17 periodic (weekly, monthly, yearly) or per-use basis, or in a number of other ways

18 consistent with the invention, as will be appreciated by those skilled in the art.

19 Those skilled in the art will recognize that the present invention may be

20 implemented in hardware, software, or a combination of hardware and software. Finally,

21 it should also be appreciated from the outset that one or more of the functional

22 components may alternatively be constructed out of custom, dedicated electronic

23 hardware and/or software, without departing from the present invention. Thus, the

1   present invention is intended to cover all such alternatives, modifications, and equivalents

2   as may be included within the spirit and broad scope of the invention as defined only by

3   the hereinafter appended claims.

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